of America.

Good Reading about Automobiles, Motors and Cycles, and the People who Make and Use Them

VOL. I NEW SERIES No. 6

# MOTOR AGE

Subscriptions
Domestic, $2.00
Foreign, $4.00
Single Copies,
Five Cents

## With Which is Incorporated THE CYCLE AGE

*EVERY MOTOR AGE ADVERTISING CONTRACT, HEREAFTER, WILL BEAR THIS ENDORSEMENT:*

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CHICAGO, FEBRUARY 6, 1902

# Columbia Automobiles

ELECTRIC

GASOLINE

**MARK XXXI ELBERON VICTORIA**

This is our latest style of Victoria, and is the most stylish single seated vehicle as yet placed upon the market. It has a double motor equipment, and the weight of the battery is equalized on both front and rear axles which adds greatly to the ease in riding and advantage in hill climbing. Its radius on one charge of battery is 40 miles, and its maximum speed 13 miles an hour.

WRITE FOR 1902 ILLUSTRATED CATALOGUE AND PRICE LIST

## Electric Vehicle Co., Hartford, Conn.

**Western Agency and Show Rooms, 267 Wabash Ave., Chicago**

# The Motor Age

A budget of good reading about Automobiles, Motors and Bicycles, and the people who make and use them.


## Motor Age and Cycle Age


MOTOR AGE, with which is incorporated CYCLE AGE, is published every Thursday at rooms 400-409 Monon building, 324 Dearborn street, Chicago, by Samuel A. Miles. It is entered at the Chicago postoffice as second-class matter.

* * *

The domestic subscription price is $2 a year; foreign subscriptions, $4 a year; single copy, 5 cents. The advertising rates, based on a guaranteed circulation of 5,000 copies, are as follows:

| SPACE | One insertion | Discounts | 7 issues | 13 issues | 26 issues | 52 issues |
|---|---|---|---|---|---|---|
| 1 Page... | $30.00 | 7 issues 10% | $27.00 | $25.50 | $22.50 | $20.00 |
| ½ Page... | 18.00 | 13 " 15% | 16.20 | 15.30 | 13.50 | 12.00 |
| ¼ Page... | 12.00 | 26 " 25% | 10.80 | 10.20 | 9.00 | 8.00 |
| ⅛ Page... | 7.50 | 52 " 33⅓% | 6.75 | 6.40 | 5.65 | 5.00 |
| 1 Inch... | 4.00 | Net rates in following cols | 3.60 | 3.40 | 3.00 | 2.65 |

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* * *

The circulation of last week's issue was 5,150 copies. 4,710 copies, weighing 957 pounds, were mailed, as shown by the postoffice receipt. The remainder were distributed by the Western News Co. and the employes of the paper.

* * *

The postoffice receipt for the week, which will enable any one to check the circulation, is as follows:

POSTOFFICE AT CHICAGO, STATE ILL.
Date Feb. 5, 1902.

Name of publication, MOTOR AGE.
Total subject to postage at one cent per pound.....$9.57
Received full prepayment of postage.
(Signed) F. E. COYNE, P. M.
By Mills.

The editor will be glad to receive communications for publication. They must be accompanied by the names and addresses of senders, which will not be used if request be made to that effect. Contributions will not be paid for unless accompanied by notice that payment is expected.


## New York Notes and Comments

NEW YORK, Jan. 31.—Things look brighter now for more reasonable legislative action at Albany in the matter of the amendments to the automobile speed laws. Those unacquainted with the quiet yet zealous missionary work the Automobile Club of America had been doing were astonished in view of the throw-down the club members got at the hearing of the Cocks senate bill on Wednesday at the apparently sudden reversal of legislative opinion that attended its discussion in the senate yesterday, when by a vote of 22 to 17 it was sent back to the committee for amendments and another hearing ordered for next Wednesday. The president and secretary went up on Monday and Mr. Chamberlin joined them on Wednesday. At the hearing the A. C. A. orators presented their arguments only to have the committee decide after a tie vote had been broken to report the bill favorably with the country speed limit raised to 20 miles as the only sop to Cerberus. These gentlemen, however, had been making an earnest personal canvass among the senators, setting forth the real situation and the injustice of making violations punishable by imprisonment. The effectiveness of their arguments and their still hunt became manifest in yesterday's formal consideration of the measure by the senate. Senators Brackett and Trainor became their champions against Senator Cocks, the father of the bill, and Senator White a trotting horse enthusiast. The automobilists only asked that the imprisonment penalty be stricken out and that the enforcement of the law be left to fines graded according to each succeeding offense. The senators thought the chauffeurs should have another chance before the committee to agree upon amendments satisfactory to all hands. It is believed that the fanatical imprisonment provisions of the proposed law have been killed by this re-reference of the bill to the committee and the ordering of a second hearing, and that the framers of it will now be forced to restrict themselves to reasonable penalties if they would hope to have it passed.

* * *

In the meantime the Robinson bill has passed to its third reading in the assembly. When both have been approved a conference committee will have to combine them into a new bill and the senate has practically

placed itself on record as refusing to pass any law with imprisonment as a penalty.

* * *

The Automobile Club of America is certainly spending its surplus fund generously for the general automobile weal. Beside sending committees to Albany to fight unfriendly legislation, it is backing quietly and without its name appearing other good roads and reform movements. It is devoting a considerable sum to the dissemination of highway improvement literature. In the cause of this your correspondent has received the report of the committee to the convention of county supervisors, held on Tuesday and Wednesday last at Albany, recommending the appropriations for macadam roads to be asked of the legislature. The demands suggested by the committee were duly made by the convention. The report showed that forty-one of the sixty counties in the state had taken advantage of the provisions of the Higbie-Armstrong law during the 4 years of its existence. Briefly this law divides the expense of highway improvement between the state and the county asking for the appropriation. In this time 59 miles of roads have been finished and 109 miles are under construction. This year twenty counties have petitioned for 238 miles of road and have raised $960,000 as their half of the money required. An appropriation of a million dollars in the aggregate is therefore asked for this year. It is suggested that the state raise this amount by the issuance of state bonds at 2½ to 3 per cent interest and tax the counties directly interested for their share and interest, thus giving them the benefit of the low interest obtained through the state's credit. Wide tires are also suggested to be made compulsory by law, thus preventing the cutting up and rapid destruction of the new roads.

* * *

Following the successful example set by the Century Wheelmen of Philadelphia, the Kings County Wheelmen, of Brooklyn, is seeking to establish an automobile membership through the inducement of turning its wheel-room into a storage station. This veteran organization has a fine house on Grant square and offers all the conveniences of a well equipped club to the automobilists. These club wheel-rooms are out of date now, the members generally keeping their bicycles at home, so the cycle contingent would practically be robbed of none of its conveniences.

* * *

President S. T. Davis, Jr., of the National Association of Automobile Manufacturers, and J. A. Kingman, of the association's advertising committee, have returned from Chicago very enthusiastic over the prospects of the show and the adequateness of the Coliseum for it.

"It is bound to be a splendid success," said Mr. Davis.

President Davis says there will be luncheon and a smoker at the show every day. If the management at the Chicago end has not already attended to it he thinks Prince Henry should be asked to visit the show during his stay in Chicago. He says that above all the European nations the Germans have given the greatest official attention to the development of the automobile by establishing competitions in construction open to the world and that its representative, Prince Henry, should be asked to inspect this splendid exposition of the progress of the United States in the new manufacturing art.

* * *

In view of the news MOTOR AGE gave this week that no letter had been received from President Shattuck and no copy of the affiliation agreement either it seems likely that now really some honest effort will be made this week to get some decisive word from the A. C. A. governors in the matter of its attitude to the Chicago club and its national convention proposition. It had been supposed in the strength of the published and undenied reports that a letter had been sent the Chicago club by Mr. Shattuck, which would eventually pave the way to some understanding between the eastern and western leaders. The positive statement is made to the writer by one who saw a copy of the letter that such a letter was written. Whether it was lost in the mails or never sent your correspondent is unable to report.

* * *

It is believed that the action of the Massachusetts and Long Island clubs in asking that the call for the convention be delayed was based on the belief that such a letter had been sent and on the feeling that the outcome of its suggestion and acceptance should be awaited before taking final action in calling a convention, in which the A. C. A. did not seem likely to take any part.

* * *

President Shattuck is said to still labor under the impression that co-operation in the convention is still open to his club on the strength of the contents of the Chicago club's original reply to its affiliation proposition. If so, so much the better. In that case retreat from the present unacceptable affiliation proposal and adoption of the national convention idea will be made easier. All feel that the A. C. A., in justice to itself, the Chicago club and the outside clubs, which are awaiting its final decision in the national association matter, should state at once positively and finally what it purposes to do or not do that the Chicago and other clubs, which have treated the New Yorkers with so much courtesy, consideration, respect and patience, may decide accordingly what they will do.

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### The Position of the Chicago Club.

Because the officers and members of the Chicago Automobile Club have declined to be drawn into a controversy relative to the proposition recently made to organize a national association of automobilists and have insisted on maintaining silence relative to the matter until it had been ascertained definitely whether the Automobile Club of America would or would not amend its original proposition, a misunderstanding has arisen in the minds of eastern men relative to their attitude. Nearly a month ago the Chicago club, having waited 30 days for a reply to its letter to the New York club and having failed to receive even as much as an acknowledgment of its receipt, asked the Long Island and Massachusetts clubs whether they would co-operate in a call for a gen-

eral meeting to be held during the Chicago show. Before those clubs had an opportunity to take action in the matter a report was given out in New York by an official of the New York club that a communication had been forwarded to Chicago, which it was expected would lead to some amicable arrangement between the two clubs.

It is altogether likely that the officials of the Massachusetts and Long Island clubs were misled by this statement, which was printed in the newspapers. At any rate, they have not, up to this time, signified a willingness to join in the proposed call.

The fact of the matter is that the officials of the Chicago club have received no communication, friendly or otherwise, from the New York club, except the original suggestion for an affiliation. Having failed to receive anything definite from any of the eastern clubs it has made no plans for a meeting. If any gathering occurs at the Chicago show it will probably be that of the American Motor League, concerning which Mr. Duryea has lately been carrying on a vigorous correspondence with the press and many other persons interested.

### Toledo Scores on Pacific Coast.

San Francisco, Cal., Jan. 25.—There's nothing the matter with the automobile trade in California. Dealers are more than pleased with business and the fine outlook. Yesterday a local agency received two carloads of latest models and two more are on the way. Carloads are still anxiously awaited by the Locomobile, Oldsmobile, Century and Toledo agencies.

Superintendent Washburn, of the Yosemite Valley Stage Line, has gone east to visit auto factories with the view of substituting horseless for horse stages in connecting the Big Valley with the railroad, 80 miles away.

N. S. Gotshall, of the International Motor Car Co., received wired notice this morning that yesterday, down in Arizona, Chauffeur Lippincott drove a Toledo up Knob Hill, a 16 per cent grade, between Flagstaff and the Grand Canyon, in 6 inches of snow. The test was made before a committee of the Grand Canyon Automobile Transportation Co., just formed by Flagstaff citizens, and was the most difficult auto test ever attempted in Arizona. The new company expects to have fifteen passenger automobiles running on the Grand Canyon-Flagstaff roadway by May 1.

### Ohio Makers Will Look Westward

TOLEDO, Feb. 3.—Four new styles of carriages will be built for this season's trade by the Geneva Automobile and Mfg. Co. These are a dos-a-dos, runabout, touring car and a surrey, making in all six different styles of vehicles. A new catalogue will be ready the first week in March. It will show an entirely new running gear. The company has been doing a nice business through the Dunham, Caregan & Hayden Co., its Pacific coast agents. On the day of your correspondent's visit Mr. Carter, who has had a long spell of sickness, stated that changes have been made in the factory management which will insure an improvement in many parts of the machine. The company has a splendid factory and showed a large number of vehicles under way. Eight of them were to be shipped that day to Los Angeles.

A call at Warren showed the Packard people to be particularly busy. Mr. Packard extended the courtesies of the factory, which, except that of the Haynes-Apperson Co., is the best and most fully equipped your correspondent has been privileged to inspect up to this time. They have just enlarged their premises by the addition of a new building which will be used for making bodies, upholstering, painting and a shipping room. Heretofore these gentlemen have not figured greatly on western trade, but now have secured proper representation in Chicago and look forward to the show, at which they will make a splendid exhibit, as the event which will mark the opening of a great business in all parts of the west.

In Warren also is the factory of the Trumbull Mfg. Co., which is getting out a few light machines and large quantities of castings for the Packard people.

The Elmore Mfg. Co. is by no means suffering for orders. Its trouble has been that it has had too many and has been delayed somewhat in obtaining supplies of bodies. Now, however, they are coming through promptly and the company will shortly be able to ship a reasonably large number of complete machines. Like all of the Ohio people, the Becker brothers, who run this concern, talk enthusiastically of the Chicago show and regard it as a certain market for a large number of machines.

The Troxel Mfg. Co., of Elyria, O., has just moved into a new factory and is doing a tremendous business, turning out from 1,000 to 1,200 bicycle saddles a day. Mr. Troxel stated that his output for this season would probably reach 150,000, distributed among manufacturers and practically all of the large jobbers. The company has prepared a saddle for motor bicycles which it will push as soon as business in that line warrants it.

### List of Exhibitors at Indianapolis.

Among the features of the coming show at Indianapolis will be a large gravel bed, designed to furnish a severe test for the machines of the makers who care to submit them. The list of exhibitors to date is as follows: National Automobile Co., American Bicycle Co. (Waverley department), Fisher Automobile Co., Lambert Gas Engine Co., Kokomo Tire Co., Mueller & Co., bicycles and automobiles; Watson & Co., bicycles; Westing & Co., bicycles; Guaranty Tire & Bicycle Co., bicycles; G & J Tire Co., tires; H. T. Hearsey Vehicle Co., automobiles and bicycles; Snyder Cycle Co., bicycles; Habich & Co., bicycles.

### The Exportation of Automobiles

WASHINGTON, D. C., Jan. 30.—The figures showing the exports of automobiles and kindred lines for the week just ended from the port of New York, are as follows: Cuba, auto-vehicles, 2 cases, $1,200; London, motor vehicles and parts, 6 cases, $1,790; Mexico, motor vehicles, 4 cases, $1,781.

## DETROIT AS A MANUFACTURING CENTER.

**Great Preparations for the Olds Product—Strellinger's Carbureter Soon Ready—Ford Coming to Chicago—New Factory**

DETROIT, Mich., Feb. 3.—To the casual observer it appears very much as if every man in Detroit who makes anything at all in the automobile line is contributing something, no matter how small, to the Olds company, and there can be no question, from what your correspondent has been able to gather, that the announcements of the large output for the coming season have not been exaggerated. Among the concerns of excellent reputation who are assisting in the production of the Olds carriage are Leland and Faulconer and the Chas. A. Strellinger Co., each supplying not less than six engines daily. The last named company will be ready for the market with a new carbureter in a few weeks. It is the design of a young man who, a year or so ago, approached Mr. Strellinger, who has always been deeply interested in gas engines, and which, after a few weeks' work in the factory, produced such excellent results that the company believes it to be the best device of the kind. A gentleman who has seen this apparatus declares it absolutely regulates the quality of the mixture, regardless of temperature or humidity; in other words, that it is capable of producing a mixture of a certain density only and from that mixture there is never a change.

The Detroit people are deeply interested in the production of H. Ford & Co. This firm manufactured the machine on which Mr. Ford defeated Winton at the Detroit races last fall. Three wagons are nearing completion, and if Mr. Ford can make arrangements in time, he may try to run one of them to Chicago for the show without a stop.

A gentleman named G. A. Troutt, another Detroit man, has been working at the Dodge Bros. machine works, and all being well, expects to have twenty-five vehicles ready for delivery by the first of April. His orders have been placed for the necessary parts. Mr. Troutt does not expect to manufacture anything which he can buy. In other words, he will be an assembler on a large scale.

### White's Steam Carriage for Six

Cleveland, Ohio, Feb. 4.—The White Sewing Machine Co. will shortly announce a new model of a type unusual in steam vehicles. It will be a touring car having seating capacity for six. It will be speedy as well as capacious. It will be equipped with an engine of nearly 25 horsepower and the water and gasoline supply will be sufficient to carry the machine 100 miles. The speed will be about 40 miles an hour. An experimental model has been completed and it is being put through a series of severe tests. The standard White for 1902 shows but trifling changes. It is 6 inches longer, the machinery is equipped with larger lubricators and the method of attaching the springs has been improved; otherwise it is the same carriage as before. The White factory is now turning out eight vehicles a week and with the systematic increasing of facilities now going on this will soon be increased to fourteen. Even with the facilities mentioned it will be some time before all of the White company's branches are supplied with sample machines, so great has been the demand. The Cleveland store has been meeting with remarkable success during the past month. Last year the automobile and the sewing machine departments occupied the same store. This year the automobile department not only has a store to itself but every facility that could be suggested for a retail automobile establishment. The new store has space for twenty vehicles. In the rear are wash rooms, in another building, only one floor of which will be used unless necessity demands still more space. The first floor has space for storing over thirty vehicles. In still another building is a repair shop.

The Price Bros. Carriage Co., 118 Prospect street, which has for some time been handling the Baker electric and Toledo steam vehicles, has taken up the Peerless hydro-carbon machine built by the Peerless Mfg. Co. and the vehicle of similar type built by the Elmore Mfg. Co., of Clyde, Ohio.

Booth & Manley, Y. M. C. A. building, leading bicycle dealers, are in the market for gasoline vehicles, having decided to take the line in addition to bicycles.

### Affairs of the Baldwin Company

The schedule of the Baldwin Automobile Mfg. Co., of Connelsville, Pa., has been filed. It shows liabilities of $100,298, of which wages amount to $2,251, secured claims to $6,500 and unsecured to $91,547. The assets are $98,605. This company formerly manufactured steam vehicles, of designs prepared by Mr. Baldwin, now engaged in the business in the east. Disagreements led to a reorganization and eventually to the appointment of a receiver who attempted to carry on the business. The plant is still intact but its future is quite uncertain.

There is still some uncertainty about the high class race meet to be held by the Springfield (Mass.) club next summer. The latest report is that the racing committee expects to secure the co-operation of the Boston club.

### Ah! What a Fall was There!

On Saturday morning last Charles Howard Tucker, western manager of the Winton Motor Carriage Co., met with a serious accident. When leaving his home he was unfortunate enough to fall on a slippery pavement, breaking his right arm at the wrist and again about 4 inches higher. He does not expect, however, to be confined to the house after the end of the week and will continue to manage the Chicago end of the Winton business and be at the office daily after Monday.

### The California Motor Bicycle

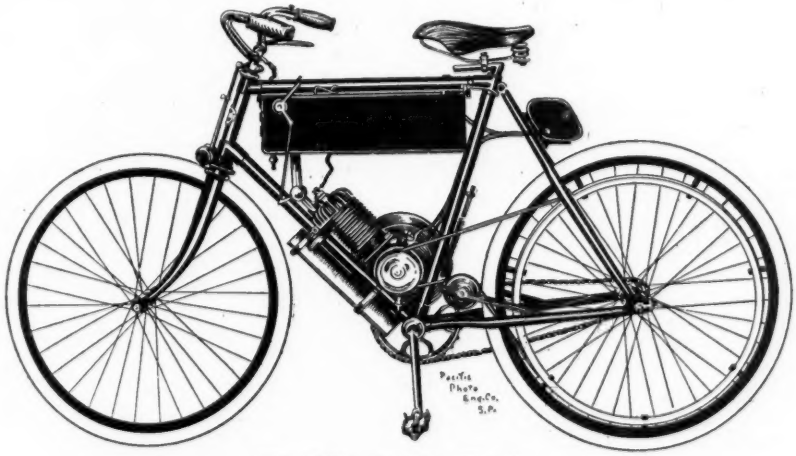
The California Motor Co., of 2212 Folsom street, San Francisco, to whose motor bicycle reference was recently made in this paper, has issued a catalogue which will be

interesting to every one who cares for this style of vehicle. The company has so far advanced with the manufacture of the machines that it is making deliveries. It reports the receipt of inquiries from all over the country, notwithstanding the fact that no effort has been made to place it prominently before the public, publicity having been limited to an article concerning it published in MOTOR AGE.

### Automobile Miscellany

There is trouble between the creditors of the American Motor Co., which recently went into the hands of a receiver, and Albert T. Otto, president, on whose application the receiver was appointed. These creditors, representing over three-quarters of the claims, protested against the original receiver on the ground that he was representing Mr. Otto and he was removed, Charles L. Carrick, of Jersey City, being appointed in his stead. The creditors complained that they had been unable to obtain access to the company's books and had been kept in ignorance of the disposition of $4,600 recently received by Mr. Otto from the government in payment for goods delivered.

On account of increased business the Crest Mfg. Co., of Cambridgeport, Mass., has taken new offices at 424 Massachusetts avenue, a short distance from the factory. It will have a fine show room, connected with the offices, to display carriages, motors, coils and various goods of its manufacture. The office is 10 minutes from Boston, on the avenue leading to Harvard college, making it exceedingly handy for friends and customers to call. This is a desirable location as all lines of electric cars running from Boston to Cambridge pass the store.



The California Motor Bicycle

F. F. and Ferd Cimiotti, of New York, arrived in Staunton, Va., recently, having made the entire trip in a Toledo steam carriage over frozen country roads, a distance of over 400 miles. They made the trip in four days, taking it in easy stages and without mishap. The best stretch of road they encountered was the Valley pike, a distance of some 120 miles, and over this they frequently made record breaking speed; in some instances equaling the speed of the local passenger trains, which paralleled them and in sight most of the way.

At a meeting of the Springfield (Mass.) Automobile Club last week it was decided, definitely, to push ahead with the plans for a race meet at the magnificent Hampden Park track the last week in May. It will last but one day and apparently is intended to whet the appetites of the people for a larger event to continue two days and to be held in September.

Banker Bros., of Pittsburg and Philadelphia, have made a large contract with the Crest Mfg. Co., Cambridgeport, Mass., for Crestmobiles. They will carry a supply of these carriages at both stores, as they control the state of Pennsylvania for the Crestmobile.

H. E. DeLoura, said to be of Rochester, N. Y., is in Ottumwa, Iowa, trying to organize a company to manufacture automobiles. He asks for a building and agrees, in return, to provide machinery to the value of $10,000.

The Octomobile Co. has been organized at San Francisco, with capital stock of $100,000, of which $50 has been subscribed. A. Kellar, J. M. Peel, C. L. Tilden, J. A. Marsh and H. F. Peart are the directors.

Harvey, Ill., a growing suburb of Chicago, which has already one big automobile factory, has organized the Pegasus Automobile Co., with capital of $10,000, to manufacture and deal in motors, boats, etc.

The St. Louis stock exchange has listed the stock of the Interstate Transit Co., now operating vehicles between that city and East St. Louis, by way of the Eads bridge. The company's stock is $250,000.

George H. Graham, Charles E. Bartley, F. B. Udelle and John A. Hawkins have incorporated the Triumph Automobile & Launch Co., of Pierrepont, S. D. The capital stock is half a million dollars.

Minneapolis, which already has one of the finest systems of cycle paths in the world, will be blessed with the addition of a dozen miles this season, bringing the total mileage up to over fifty.

During the winter the B. F. Goodrich Co., of Akron, O., will make further additions to its buildings. The adidtions is to be 50x250 feet and will be used largely as a warehouse.

The Toledo plant of the International Motor Car Co., which has been shut down for stock-taking and repairs for the last three weeks, has started again with a force of 600 men.

Ralph Temple, who has heretofore conducted his business as a purely individual enterprise, has just incorporated with capital stock of $20,000. There will be no change in the conduct of his business, however.

## NON-FREEZING LIQUIDS FOR CYLINDER JACKETS

BY E. E. KELLER.

When cold weather came on last fall I became interested in the subject of non-freezing liquids for cooling gasolene automobile motors, and began to inquire among builders, agents and users as to what was a satisfactory and non-injurious solution. I had occasionally noticed, in some of the automobile journals, mention of calcium chloride solutions and diluted glycerine for this purpose, but nothing of a definite or positive nature. The articles noted were usually nothing more than remarks that this or that substance, in indefinite and varying form, was suitable.

My inquiries proved that there was no definite information to be had from the sources tried. Among the objections to calcium chloride were the following: "Engine got too hot"; "Stuff would freeze when it was only moderately cold"; "Cost too much," and, most alarming, "We have tried it at the factory and it ate holes in the tanks, pipes and even the cylinders."

Glycerine was said to work well, in some cases, but was very expensive, became foul in a short time and had to be frequently renewed. Where rubber hose was used in connecting various parts these were attacked and caused failure.

I then decided that, inasmuch as Ca $Cl_2$ was supposed to be a neutral and inert substance, and was really cheap, if not purchased in homeopathic doses, it being practically a by-product worth, in large quantities, from ½c to 1c per pound and purchasable in the quantities now under consideration at from 5c to 10c per pound (although one wholesale chemist asked me 65c per pound for the commercial article), I would avail myself of facilities, in the way of assistants and apparatus, ready to hand and have a few simple and easily made determinations carried out, so that the information to be gained might be available for the free use and information of my fellow users of gasoline automotors, and that the doubts now surrounding the subject might be, to at least some extent, removed from their minds.

The diagram (Fig. 1) shows freezing points of Ca $Cl_2$ solutions, plotted from a table given in Siebel's "Compend of Mechanical Refrigeration," which will be seen to produce a slightly erratic curve. The diagram also shows freezing points of such solutions determined for me by L. H. Flanders in one of the laboratories of the Westinghouse Machine Co., the lowest point being at 2° below 0° Fahr., this being where the brine tank, in which test solutions were chilled, froze solid. The boiling points of the same solutions were also determined, as shown in upper part of diagram.

I have added a curve of boiling points as given in "Dictionary of Solubilities," by A. M. Comely, which are slightly higher than those determined by Mr. Flanders, possibly due to errors of observation, as there was no effort to make extremely accurate determinations, it being unnecessary for the case in hand.

It will be noted that a solution of Ca $Cl_2$ of about 1.20 specific gravity will not freeze until it has reached a temperature of about 15° below 0° Fahr and that it boils at about 220° Fahr. This solution should, therefore, be satisfactory in any reasonable climate. As to the question of injurious action of this solution on the metals with which it must come in contact, at the temperatures mentioned, I would say I now feel satisfied that there is no cause for apprehension, except possibly in the case of galvanized iron or of zinc. Careful experiments to determine this question were made for me by H. C. Babbitt, chemist at the laboratories of the East Pittsburg Gas Works, whose report in condensed form is to the effect that tests were made to find the action of commercial calcium chloride upon soft steel, cast iron, sheet copper, sheet brass, galvanized iron, and zinc. From 10 to 15 grammes of clippings of each metal were care-

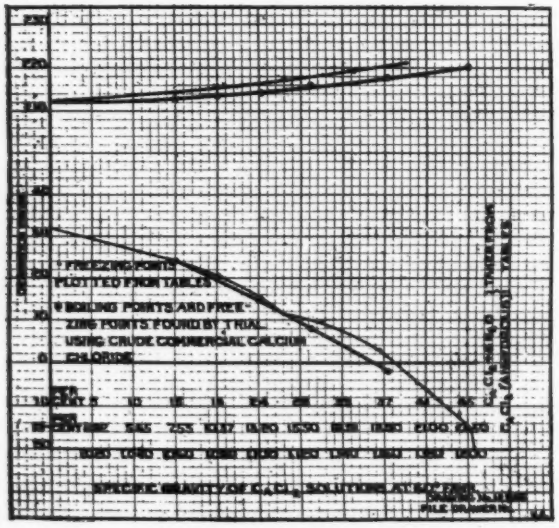

FREEZING POINTS PLOTTED FROM TABLES
BOILING POINTS AND FREEZING POINTS FOUND BY TRIAL USING CRUDE COMMERCIAL CALCIUM CHLORIDE

Figure 1

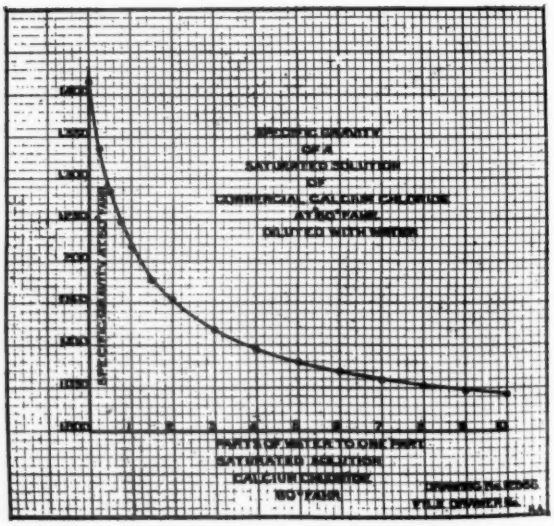

SPECIFIC GRAVITY OF A SATURATED SOLUTION OF COMMERCIAL CALCIUM CHLORIDE AT 60° FAHR. DILUTED WITH WATER
PARTS OF WATER TO ONE PART SATURATED SOLUTION CALCIUM CHLORIDE AT 60° FAHR.

Figure 2

fully weighed and kept at a temperature of practically 212° Fahr. in a 50 per cent. solution for periods of from 3 to 9 days, the solution being allowed to boil during part of the time. The results were as follows:

| | Lost in weight, per cent. |
|---|---|
| Steel | 0.07 |
| Iron | 0.09 |
| Copper | 0.07 |
| Brass | 0.001 |
| Galvanized iron | 0.16 |
| Zinz | 0.47 |

These figures are extremely small and, probably, at least partly due to the removal of a small amount of oxide or scale and possibly even dirt, excepting in the cases of galvanized iron and zinc, the latter of which is evidently attacked, and, therefore, this metal and galvanized iron, on which the zinc would also be attacked, are not so well fitted for use in the circulating system of an automobile. The figures would indicate that the solution had no action whatever on brass and only a very slight and negligible action on other metals than zinc. They look larger in percentage than by actual weight. In each case the weight actually lost was in fractions of a milligramme, and would be considered within the limits of error.

Since writing the foregoing I am in receipt of a letter, under date of Jan. 17, 1902, from Elwood Haynes, of Kokomo, Ind., stating that he had made a similar test about a year ago with iron and copper, and that he had found, after ten hours' boiling in a strong solution, a very slight loss in the case of the iron, which is ascribed to the removal of a small amount of scale; but the losses on both metals were practically nil and negligible. No tests on galvanized iron were made, but are now being carried out. Mr. Haynes further states that he has had this solution in a carriage for several months this winter, and has been unable to find any indications of injury. In my own machine, in which galvanized iron is used, I have had this solution for a month or more, and have had careful analyses made of small samples of the solution drawn each week, with no indications of the presence of any one of the metals included in the system.

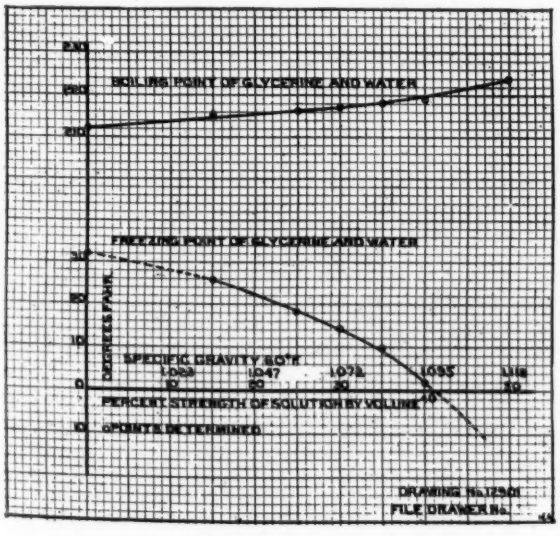



Figure 3

In the case where serious injury was reported from the use of calcium chloride, I believe that this substance was in some way substituted by some other, and that, in all probability, chloride of lime, whose chemical formula is Ca $OCl_2$, was used. As the average automobilist has no facilities for determining specific gravities, and as making a percentage solution by weight of a delinquent substance such as Ca $Cl_2$ is a very unreliable procedure, I append a curve (Fig. II) showing parts of water to be added to one part of a saturated solution of Ca $Cl_2$ to produce, approximately, solutions of various specific gravities. To be fairly accurate, the saturated solution must have a temperature of 60° Fahr., and it can best be made by dissolving as much of the salt in water as the water (thoroughly stirred) will take up, with some crystals left undissolved when the solution is at 60°. Roughly, to make one gallon of saturated solution will require about one-half gallon of water and eight pounds of the commercial calcium chloride, having, usually, the chemical form of Ca $Cl_2$ plus 6H 2O. It happens that approximately the best solution for our purpose in this latitude (Pittsburg, Pa.) can be made by using one part saturated solution and one part water. All that is needed, therefore, is a measure of some kind and a fairly reliable thermometer. The solution will contain some insoluble impurities and should be carefully strained or filtered.

Some samples of calcium chloride contain more or less "hydrated water" than is given in the above formula, and, therefore, the quantity of crystals per gallon of saturated solution may vary somewhat. In other latitudes a solution of higher or lower specific gravity may be advisable, and it is well to use as weak a solution as will be safe against freezing at the lowest temperatures to which the vehicle will be exposed. It is important that, when a solution of high specific gravity, such as proposed for this latitude, for instance, is used, it be not allowed to concentrate materially by evaporation, but that water be frequently added to the tank so as to keep the solution fairly normal; otherwise crystals may form in pipes and cause trouble. A good plan is to purchase a suitable hydrometer, and occasionally measure the specific gravity; but this is not really necessary. For the use of anyone who may prefer glycerine I append a diagram (Fig. III) showing curves of freezing and boiling points of various volumetric percentage solutions. Probably the best glycerine solution to use in this climate is one made up of one part glycerine and one part water. Any losses from leakage should be made up by the addition of fresh solution in either case, while losses from evaporation are to be made up by adding water as above mentioned. It will probably occur to most users of acetylene lamps that the above calcium chloride solutions can be used in place of pure water, and winter troubles avoided.

## HOW TO MAKE AN INDUCTION COIL

BY L. ELLIOTT BROOKES

Some time ago the writer contributed to MOTOR AGE, in a general way, information relative to the construction of an induction coil. Such general interest is now manifested in the subject that further details will perhaps interest many readers and furnish them a better

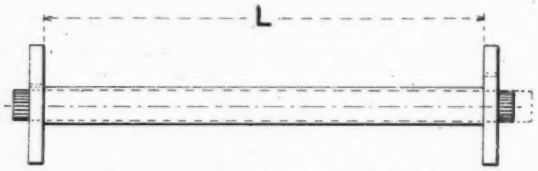



Fig. 3—Iron Wire Core and Insulation.

idea that they now possess of the intricacies of a device of whose peculiarities so little is generally understood.

The first part of the coil, and the foundation of the same, to be constructed is the core. This is composed of a number of lengths of soft iron wire, which should be about No. 18 or 20 B. & S. gauge—not larger. This wire should be first carefully straightened, then cut to the proper length, and before using should be carefully annealed and allowed to cool, thoroughly covered in unslaked lime. The wires forming the core can then be assembled. To do this properly take a piece of brass or steel tubing, whose inside diameter corresponds to the required outside diameter of the core. Assemble the wires in this tube, which should be from 1 in. to 1½ ins. shorter than the over-all length of the core.

After assembling the core in this manner dip one of the projecting ends in melted solder, withdraw the core almost entirely from the tube or pipe and tie a small piece of the soft iron wire around the part of the core

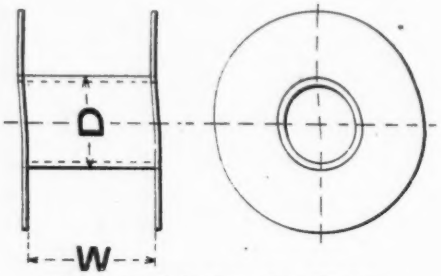



Fig. 4—Spools for Secondary Winding.

adjacent to the tube, so as to prevent it spreading. Then withdraw from the tube, dip or immerse this end in the melted solder, the same as has been done with the other end, and the core is ready for use.

Two vulcanized fiber washers about five times the diameter of the core and about one-quarter inch thick are necessary to form the ends of the spool upon which the primary is to be wound. These should be made a driving fit upon the core and spaced the right distance apart, according to the size of the core. The insulation around the iron wire core should be of four or five layers of heavy paper securely fastened around the core, and before the last one of the two fibre washers is put in place on the core an insulating tube of mica or micanite must be slipped on over the primary winding, and again over the mica insulation two or three layers of thin paper should be wound. This will then form the basic insulation for the primary winding.

Figure 3 shows a detail of the iron wire core with vulcanized fibre washers and paper insulation in position upon the same. The dotted extension on the right hand end of the core proper shows the additional length which is to be added to the core when a vibrator coil is to be constructed instead of a single break or jump form of coil.

The spools upon which the secondary wire is to be wound are clearly shown in figure 4. These should be of mica or micanite, and preferably made as shown in this figure; that is of a tube with end washers slipped over

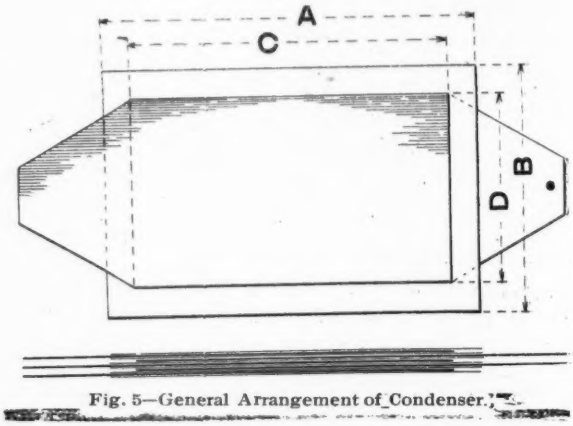



Fig. 5—General Arrangement of Condenser.

same, so as to leave perfectly sharp corners at the inside corner of the flanges, so as not to interfere with the close winding of the secondary wire at these points.

After the secondary spools have been wound with the requisite amount of wire, each spool should be bound around with one or two layers of medium tissue paper, fastened around upon itself with a little mucilage, care being taken, however, not to get any of it upon the wire. A piece of book binder's cloth should then be cut into strips a trifle smaller than the inside width of the spools, and long enough to make a good lap. The better plan is to attach the inner end of each strip of cloth to the tissue paper already over the wire, by means of a little mucilage, and when dry the outer ends can be pulled up tightly to overlap the ends already in place and securely fastened in the same manner.

After the primary wire is wound upon the core and its outer insulation in place, one of the end washers must be carefully taken off, to allow the secondary spools to be slipped on over the outer insulation of the primary winding. It is perhaps better and easier to make a dummy washer for the end of spool at which the primary is started to be wound. This can be made of two small blocks of hard wood, with a hole, half in each the same size as the iron core, and also a small groove

in one of the blocks next to the core to allow the starting end of the primary wire to be outside the washer and yet be undisturbed when the dummy washer is removed. This clamping washer should be held together by means of two small wood screws. Figure 5 gives the general arrangement of the condenser. It is made up of alternate layers of paper and tin foil, as shown. Each alternate sheet of tinfoil has its projecting end on opposite ends of the pile. The paper which forms the insulation of the condenser must be of good quality and highly glazed. Before using the same it must be thoroughly coated on both sides with a thin solution of the best copal varnish and allowed to get perfectly dry and free from all stickiness. After the condenser is assembled the projections at each end should be fastened together; that is, all at one end and all at the other end of the condenser, by means of small screws and nuts with washers, so as to insure a good contact between the rsepective leaves. Now take two heavy sheets of press board the same size as the insulated paper and place one sheet above and one below the pile, put three or four wide rubber bands around over the press boards to secure the whole together. Attach a length of well insulated wire to each one of the condenser connections, then fold one set of the projecting ends over the top of the pile and the other one underneath. Then enclose the pile in a sheet of glazed wrapping paper in the same manner that a box would be wrapped, bringing out the insulated wires through the paper at opposite ends. Secure this package from becoming unfastened with rubber bands

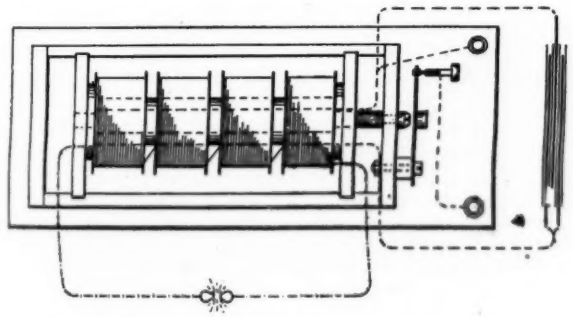


Fig. 6—Plan of Coil with Top Removed, Showing Battery and Condenser Connections

placed both longitudinally and laterally around the package and the condenser is ready for use.

Figure 6 is a plan or top view of the coil, with cover removed, showing the battery and condenser connections. The condenser must be connected as shown across the terminals of the primary winding, before they connect with the vibrator. The dot and dash lines show the secondary connections. Do not use any shellac or paraffine as a means of insulation in or around the coil. Both have a weakness to absorb moisture from the atmosphere and are a detriment to the proper working of the coil instead of being an advantage. A table is appended giving the dimensions of the condenser and number of layers for each size coil; also length of primary coil and dimensions of insulating spools for the secondary coils.

| LENGTH OF SPARK | | CONDENSER | | | | | CORE | | SPOOLS | |
|---|---|---|---|---|---|---|---|---|---|---|
| Vibrator | Single Break | A | B | C | D | No. of Layers | Dia. | L | D | W |
| $\frac{1}{2}$ | $\frac{1}{4}$ | 7 | 5 | 6 | 4 | 30 | $\frac{3}{8}$ | 6 | 1 | $1\frac{5}{8}$ |
| $\frac{3}{4}$ | $\frac{3}{8}$ | $8\frac{1}{4}$ | $4\frac{3}{4}$ | 7 | $3\frac{1}{2}$ | 40 | $\frac{1}{2}$ | 8 | $1\frac{3}{16}$ | $1\frac{3}{8}$ |
| 1 | $\frac{1}{2}$ | $9\frac{1}{2}$ | $5\frac{1}{2}$ | 8 | 4 | 50 | $\frac{5}{8}$ | 10 | $1\frac{5}{16}$ | $1\frac{1}{4}$ |
| $1\frac{1}{4}$ | $\frac{7}{8}$ | $10\frac{3}{4}$ | $6\frac{1}{4}$ | 9 | $4\frac{1}{2}$ | 60 | $\frac{3}{4}$ | 12 | $1\frac{1}{2}$ | $1\frac{5}{8}$ |

## Important Considerations in Steam Carriage Construction.

CONTINUED FROM LAST WEEK AND CONCLUDED

In connection with generators there is a point to be carefully attended to. Be sure to get the latest model, which cuts off the fuel at the nipple which admits the gas direct to the burner, and avoid the old style which shuts off the fuel at the outside of the generator only. In the latter the inner chamber, located inside of the burner proper, remains full of oil, even after the valve has been closed, and this must be consumed before the fire decreases to any appreciable extent, thus making it impossible to realize the desired result at the right time. The old type has short shanks, while the new has long needles and shanks, varying according to the ideas of the makers.

The value of reliable steam pumps cannot be overestimated. They play an important part in the equipment for various reasons, prominent among which are the facts that they have a capacity far in excess of that of the old cross-head and hand pumps and that they may be so connected that their starting and stopping may be controlled, either by hand or by an automatic water level. This regulator is composed, mainly, of a cylinder, inside of which is a float, attached to an arm which in turn, is attached to a steam valve in the pipe which connects the pump to the boiler. The rise and fall of the float due, of course, to the rise and fall of the water in the cylinder opens or closes the steam valve to the pump and starts or stops it, as the case may be. By this means the pump, without effort on the part of the operator, keeps the water in the boiler at the proper level.

The regulator should be placed as far as possible from the boiler, for the reason that still water is desirable to insure accuracy of operation, and this can best be secured in the position suggested. By the use of this equipment, provided, of course, it is a reliable one, the driver is relieved of many cares in operating his carriage and may depend on far fewer stops than would be necessary under the old plan. The old warning may be added here. The use of large pipe connections is imperative. By the use of small ones the value of the device will be greatly impaired.

There are low water alarms which are made on the same general plan, but which, instead of operating a valve to the pump, allow the steam to pass through a

small whistle, thus giving a signal to the operator that it is time to do business, by means of a steam pump if he has one, and by hand if he has not. The advantages of the automatic device are, of course, obvious.

Another labor-saving device is a steam pump for maintaining the required air pressure in the gasoline tank. Its principle is about the same as that already described for the water, but it is operated by air pressure, of course. There are a number of air compressors on the market, some of which operate in connection with the water pump and some separately. The writer's experience indicates that the latter is preferable. Those connected with the water pump operate slowly and their capacity is limited. Their stroke is too short, but it cannot be lengthened because the efficiency of the water pump would then be impaired. The other kind has a longer and faster stroke and is consequently capable of far better work.

Although there are a great many injectors on the market for which efficiency is claimed by the makers, and which have given satisfaction to some users, they have not proved altogether reliable for use in connection with automobiles.

Before leaving the subject of water supply it may be well to say that the necessity of metallic packing in the pistons of water and air pumps is becoming more apparent all the time.

It may seem extraordinary to talk about a changeable gear for a steam carriage, but the fact is that in some parts of the country there are such steep hills as to make it impossible for vehicles of the standard pattern to be used. It may be said, by some, that automobiles were not intended to be used in districts of that kind, but the fact remains that, sooner or later, automobiles will be used wherever horses can go today and the maker who is prepared to supply the necessary vehicle will profit to the extent of the business obtainable in these hilly districts. The writer has observed cases in which vehicles carrying 200 pounds of steam were unable to climb hills which gasoline vehicles of the same rated horsepower surmounted with comparative ease. There is no other way to account for this than that the direct method of connection, while sufficient on roads which have no extraordinary grades, is not satisfactory under the trying conditions referred to. Any builder who contemplates producing a steam machine for use on unusual grades can avoid the expense of an extremely large boiler and engine and still secure the desired results by the addition of a speed changing gear which will allow one very low gear to be used for hill climbing only.

No matter whether a vehicle under construction is to be propelled by steam or gasoline, weight should not be considered of such importance as to warrant the lightening of vulnerable parts. This thing has been done in many cases with disastrous results. Light running gears have been mainly responsible and it is undoubtedly true that some of those of standard makes, supplied by some of the supply houses, are lighter than they ought to be. The experience of a Chicago physician will serve to illustrate how dangerous it is to accept any chance on even an apparently unimportant part. The supplies for a steam carriage were purchased in accordance with the ideas of the owner to be. The running gear was of the standard tubular type and from the standpoint of good appearance left nothing to be desired. During the first trial the small bent rod which connects the side steering standard to the rod leading to the center lever broke off short. The machine ran into the ditch, the frame was broken, a tire ruined and the owner injured quite severely. The bent rod in question was but a quarter of an inch thick. Twice or even three times that size is preferable. Incidentally one is reminded of the declaration once made by Mr. Overman, now of the Overman Automobile Co., to the effect that the use of cheap material, or indeed anything short of a forging, in a case wherein the life of the user was practically at stake, was nothing less than criminal.

Steering knuckles are frequently made weak in an effort to keep down weight. Axles, too, are overloaded to an extent which causes positive alarm to careful mechanics and glee to the man whose business it is to make repairs. Orders are given every day for front spindles machined down to three-quarters of an inch, contrary to the advice of people who have made a careful study of construction. Rear axles are erroneously made an inch in diameter for vehicles which, without passengers, weigh from 800 to 1,000 pounds.

It is but fair to state at this point, perhaps, that the complaints above made refer rather to individual builders than to what may be called manufacturers of machines on a large scale. The latter have discovered a great many things within the last year or two which have convinced them that a toy automobile is not the proper thing to offer the public. Those of us who have not had an opportunity to see all that has been done in the line of improvement will be furnished an opportunity at the Chicago Coliseum the first week in March. Prospective builders now engaged in the production of experimental machines with the idea that they will be able to provide something so light and tasty that people will have none other may save themselves many a heartache by profiting by the experience of older makers.

The matter of cost enters largely into the consideration. The lines of parts which may be depended upon are more costly, hence the rise rather than decline in price of the standard vehicles.

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According to the Milwaukee papers an attempt will be made there to hold a race meet immediately after the Chicago show and to secure the attendance of Fournier, Riker and Winton. Considering the time of year this reads like a fairy tale.

Rene de Knyff, Fournier and Charron have been selected as the representatives of France in the Gordon-Bennett international cup race to be run during the coming summer, probably between Paris and Bordeaux.

B. H. Campbell and J. R. and C. H. Lott have organized the Erie Motor Carriage and Mfg. Co. at Frankfort, Ind., capitalizing it at $100,000.

## CORRESPONDENTS' VIEWS AND QUESTIONS

GUINDA, N. Y., Jan. 28.—Editor MOTOR AGE: I am in trouble with my motor bicycle and would like you to help me out. I have a 2¾ Aster motor bicycle made by the Waltham Mfg. Co. I can get a coil to stand only a short while. I have purchased two inside of 2 or 3 months. I understand the construction of sparking coils fairly well, so I do not think they short circuit through carelessness. I am very careful. The Dow coils used are about 3½x7, with condenser coiled around, with three terminals. I want to try and build me a coil by using the old ones. I do not think there is enough secondary winding on these coils or else they would not short circuit so easily. If it is not asking too much I would like you to give me full instructions for making a first-class coil with connections to condenser and terminals explained very fully. Please explain fully what is meant by two and four cycle engines.—Yours, etc., G. A. WELLS.

The coil mentioned is one of the best made and it would not be advisable to attempt to rewind it. Rather send it to the makers, for they can undoubtedly repair the damage better and in less time, having all facilities for such work. Coils can be damaged and practically ruined by attempting to test the length of spark by detaching the secondary wire from the plug, holding it near the engine and then making and breaking the primary circuit. This would be all right if care were taken at all times to keep the end of the wire at the same distance from the engine as the points of the plug are usually separated, but in ninety-nine cases out of 100 this is not done and the result is that though the snap is heard the spark is not seen, which means that the coil has short circuited on the inside. This difficulty is really the greatest one the makers of coils have to contend with and the fault is not that of the coil but of the party handling it. If it is desirable to test a coil in that manner, all that is necessary to insure the test being made conclusive and safe to the coil is to attach the wire to the plug, taking the latter out of the engine and laying it on the motor. See that the metal on the end of the plug to which the wire is attached does not come in contact with the engine, else no spark will take place. If after following these instructions the spark obtained is a rich purple, having a tinge of red, it is all right and will provide successful ignition if other conditions are right. If it be a thin blue and the spark takes place every time the contact is broken, look to the battery for the trouble or to the make and break apparatus points, which may need cleaning with emery in order to provide a clean and even contact surface.

So far as the winding on the coil is concerned, it is safe to assume that the knowledge of the makers was such that a sufficient quantity of wire was used on the secondary to give the necessary results in conjunction with the core and primary winding used, the two windings being of necessity made in relation to each other and of such proportions as to give the best results with the least possible battery consumption. Should an attempt be made to add wire to the secondary, it is possible to alter the construction so that without attention being given to the primary in the same ratio the results will not be satisfactory. Then again, the winding of a high tension coil is not the easiest matter, as some of the makers of these goods are aware; yet they devote all their time to the manufacture of such goods. The insulation, when the high voltage is considered, is a difficult matter to provide. We would suggest sending the coil to the makers and having them rewind it.

It is quite possible that the compression in the motor is greater than the builders of the machine provided for, and that by the use of a larger coil the difficulties would be overcome. Instances of this kind are not uncommon.

This correspondent's questions have been answered at some length because the troubles related are not uncommon. The description of the construction of a coil will be found in this issue.

A two-cycle motor is one which provides for power impulse each revolution; a four-cycle motor is one that provides for power stroke each alternate revolution.

### Words of Praise for the White

BRUNSWICK, ME., Jan. 31.—Editor MOTOR AGE: If the intent of your correspondents' department is to help those who own automobiles, I give as the most direct route for overcoming all difficulties the purchase of a White machine. I have owned and operated several makes of steam and gasoline vehicles for the past two seasons and have had troubles enough to fill one whole issue of your magazine, until I purchased a White machine. This machine has had more hard usage than any I have owned—over rough frozen roads—and with the exception of a breaking of one of the forward springs I have had absolutely no trouble whatever.

I trust you will publish this, because any one else can make the White machine do as well as I have, for I am a hard user of an automobile. Those who take my advice will not need to read your "Trouble Column." I have no interest whatever in the White vehicles, except that the change from the regular steam machines to this type brings one so near perfection that I wish to speak a good word for the White when an opportunity presents itself.—Yours, etc., H. C. BAXTER.

### Humorous Now, but Troublesome Then

NILES, O., Jan. 31.—Editor MOTOR AGE: I started out one fall afternoon for a little town some 8 miles distant. The weather was fine, the roads better, and everything was lovely. There were four in the party and about 400 pounds of tools—we were going out to do some work on an engine. Our carriage is of the ordinary single-seated gasoline type, weighing about 2,000 pounds, and although the tools and the two extra passengers were riding on the back, it did not seem to bother the engine at all. We had gone, perhaps, 5 miles when we on the back felt steam rising through the joints in the body. Lifting the top panel, the writer found that the supply

pipe from our water tank to the pump had burst; why we do not know, unless because it was on an automobile, and there was nothing else to happen. We "whooped things up" and got the rest of our way without damage to the engine, although everything was pretty hot by that time. There we were, 8 miles from home, and without anything with which to repair the pipe.

We started to scour the town and by dint of much questioning located an ancient soldering outfit, bought a great many years ago, and apparently much used since. Borrowing this outfit, we proceeded to our destination, about a mile, and there, while two of our men were doing the work, the writer and his father soldered the burst pipe and got water from a neighboring house to fill the system again.

Just at dusk we started home and after going about half a mile were pleased to find that the chain which ran our circulating pump was broken and that the water was getting hot very fast with almost no circulation.

We got out and inspected the chain, finding that there was a flaw in the metal, although why it took that particular time to break we do not know. We were able with some effort to reach down into the body and turn the small sprocket on the pump slowly. We found that about 5 minutes' turning would replenish the water in the cylinder jacket, and so about every 5 minutes all the way home we had to stop and fiddle with that pump. We finally got back to town, and when about one-half mile from home our carriage suddenly "died." Investigation showed that we were out of gasoline, so we went to the house of a friend near by and borrowed a gallon. We reached home at just 8 o'clock, supperless, dirty, tired, but triumphant. The writer is of opinion that he would try it again just for the sake of seeing what would happen next time.—Yours, etc., H. T. PACENDON.

### Leak in a Feed-Water Heater

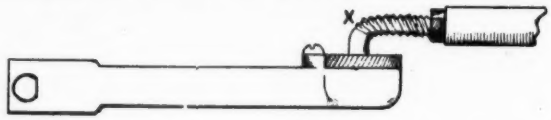
TROY, N. Y., Jan. 29.—Editor MOTOR AGE: Some time ago I had an experience that caused me a great deal of trouble and annoyance. My carriage is one of the steam runabouts equipped with feed-water heater, double acting brake, etc. One day when I was running along a fairly good country road I noticed a constant stream of water running out of the exhaust pipe. I opened the by-pass controlling the pump, thinking that I had let the water get too high in the boiler, which, however, was not the case, as the water glass was but two-thirds full and I could get nothing but steam from the top cock on the water column. The next thought that came into my head was that the boiler was foaming. So I got into the carriage and started for home. My carriage, which ordinarily ran 30 miles on one tank of water, now would run about 10. Reaching home with a great deal of difficulty, I put the carriage in the barn, resolving to get at it early the next morning. For weeks I did everything I could think of that would tend to clean the boiler out, but to no avail. Then I made up my mind that it was not the boiler. It must be a leak in a water pipe somewhere. Now in my muffler there is a coil of pipe 36 feet long that the water runs through on its way to the boiler. It is called the feed-water heater. I came to the conclusion that that pipe leaked and when I was pumping water into the boiler it would leak into the muffler and gradually fill it. The muffler being full and more water coming in all of the time, some would have to get out somehow and as the muffler only had one pipe leading from it, namely, the exhaust pipe, the surplus water had to run out of this pipe. On testing I found this to be true, so removing the feed-water heater and soldering up the leak, I replaced it and found everything to work fine.—Yours, etc., HARRY L. JONES.

### Wants an Agency for a Motor Bicycle

PRINCETON, ILL., Feb. 1.—Editor MOTOR AGE: We are ready to receive communications from manufacturers of reliable motor cycles. We are probably as well positioned to push a line of these goods as any one in the state.—BANSCHBACH & Co.

### Dealer Corroborates Complaint of User

CHICAGO, Feb. 3.—Editor MOTOR AGE: I notice in your last issue a letter from a reader of MOTOR AGE to the effect that a certain part of the popular form of side steering apparatus, now being provided by makers of running gears, is too light, and that, owing to breakages of this part, many accidents have occurred. I desire to add that if the part referred to is the same as that of which I send sketch, I coincide with the writer to




the letter. I have been uncomfortably near a law suit on account of having sold such a gear to a customer, the gear having broken at the part illustrated with the result that the machine was damaged to the extent of a new running gear—which was purchased elsewhere than from me! Beside the damage to the gear the occupants of the carriage were terribly injured. I suggest that at least half-inch stock, and preferably larger, be used at the point marked X and not threaded at the bend. That part should be a forging, and not a little piece of ½-inch soft steel bent to shape. Trusting you will find use for this and thanking you in advance, I am, Yours, etc., P. J. DASEY.

### Do One Thing and Do It Well

GENEVA, Neb., Feb. 1.—Editor MOTOR AGE: I will relate a couple of experiences and leave you to judge whether they are useful to your readers. My rig is a steam vehicle, which I had noticed some times steamed better than at other times, hence when I found difficulty one day in keeping pressure, I did not pay much attention to the incident, but let the machine stand until morning. Next day, however, I became convinced that something was wrong, took off the entire fire box, and disconnected all the gasoline pipes only to find the trouble caused by a little dirt which prevented free discharge of gas into the mixing tube. Had I known the cause of the

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trouble I could have shut off the fire, unscrewed the valve nearest the jet, taken out the screw plug back of the jet and in a direct line with it, run a wire through and cleaned out the dirt all in two minutes or before the generating pipes would have had time to cool. As it was the job took three hours. One night, when it was quite dark, I was driving about 20 miles an hour when the light of my Twentieth Century acetylene lamp became low. I attempted to reach it to turn the jet on stronger, threw the lever to the left, lost my balance by the sharp turn of the vehicle to the right and went into the ditch, breaking several spokes, bending the rim and springing the front axle and both side bars. Moral: Hold onto the guide like grim death. Do one thing at a time and do it well.—Yours, etc., J. W. PUCKETT, M. D.

### Batteries Trouble a Motocyclist

MANKATO, MINN., Jan. 27.—Editor MOTOR AGE: My brother and I have been taking MOTOR AGE for the past 2 years and I would like to call upon you now for a little help if you can give it. I have a motor bicycle and have had quite a little trouble with the batteries. Can you offer any suggestions or can you give me the name of any manufacturer who makes a dynamo which will be small enough for this purpose and still guarantee it to be strong enough to give the necessary spark and stand the jar of rough roads without injury.—Yours, etc., J. E. BRETT.

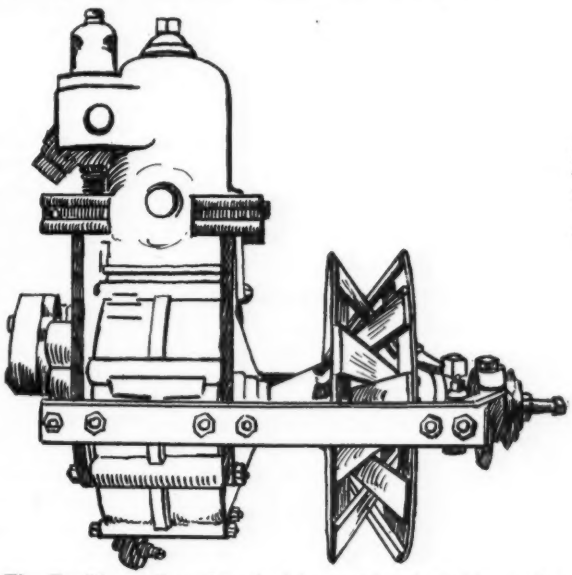
The battery question is a hard one to decide. They are of such nature that anything but the most careful handling is likely to greatly lessen their efficiency or ruin them altogether. The trouble, in most instances, has been that the wiring has been poorly done, allowing some of the connections to come in contact with the frame or metallic parts and short circuiting; in others, owing to too long a contact, more battery power than is necessary is consumed; in still others the coils are reduced in size for economy to such an extent that they can operate only on an extremely heavy consumption of current, thereby demanding continual renewal of batteries. Some makers use large coils and while the original cost in producing their machine is higher than some others, the results, so far as the ignition is concerned, are of the best and can be depended upon to a far greater extent than when small coils are used.

Mr. Brett's trouble may be caused by this, or it may be that the battery was of low efficiency when first secured. A number of advertisers in this paper provide batteries that have a wide sale and may be of service. There are no igniting dynamos small enough and sufficiently tried for use on a motor cycle. While size is a point to consider, the power of the motor would be hardly sufficient to drive an igniting dynamo and still leave sufficient for propelling the machine under everyday conditions.

### Fouillaron Gear First Made in Boston

BOSTON, Mass., Feb. 1.—Editor MOTOR AGE: In the issues of MOTOR AGE of Jan. 16 and 30 you described the transmission device of Fouillaron, exhibited at the recent Paris show, which is probably a copy of mine, of which I enclose a copy. I had to disclaim the interlocking pulley on a reference to an old English patent, on which there was no bearing on the inner ends and consequently was of no use, as it would bind on the shaft. There were points on each disk with holes in the disk opposite for the points to extend through.

I have one of my devices made for a carriage which I am making at odd times. Unfortunately I have not much time to spare from business, but hope to have the carriage out some time this year. The transmission I have made is at an angle of 45 degress with a V belt, through the center of which I run a bicycle chain to keep it from stretching, but a belt will run when quite loose without slipping. I hope to do something with the device after I get my carriage finished and have a chance to show it.—Yours, etc., W. H. GRIFFITHS.



The Fouillaron Gear described last week, which Mr. Griffiths claims as his invention.

The writer's letter-head shows that he is a maker of models and patterns at 62 Sudbury street, Boston. Accompanying the letter is a copy of the patent referred to, filed Oct. 7, 1896, issued Sept. 14, 1897, and numbered 589,989. The patent shows that the French carriage embodies the principal features of Mr. Griffiths' design, so far as the pulleys are concerned, and that the changing of diameters is accomplished in the same way, the mechanical appliance adopted differing only in details. The belt used by Mr. Griffiths is not copied, however.

### Who Will Build This Steam Carriage?

LOS GATOS, Cal., Jan. 25.—Editor MOTOR AGE: I have been looking over your journal and see a good many different kinds of automobiles, but none is what I want. I want a steam wagon that will accommodate twelve passengers without crowding any one, to use for excursion parties. The seats must be crosswise, like a four-seated surrey, each seat to hold three people, and must

be 4 feet 6 inches in the clear, well upholstered with leather, spring back and spring cushions, so as to ride very easy. Must have canopy top with side curtains. Would like to have two gears on it so as to have power enough to climb a 20 per cent grade with ease at say 5 miles an hour on country roads, loaded, and to travel about 20 miles an hour on the level.

There is a big demand for those wagons on this coast if they can be built to stand the racket and have power enough to climb hills. I want to carry water and gasoline or distillate enough to run 50 miles on ordinary roads.

Can you inform me if there is a company that can and will build me one at a reasonable cost? If so, please notify them also and let them send me their price and terms of contract. Of course, it must be a responsible company. I will deposit money in any bank in San Francisco to guarantee good faith.

The Mobile Co. of America has sent some out here which they claim will hold twelve people. They are nice-looking vehicles, but they are side seaters and will not give satisfaction, and I think are built too light to stand the work. As I have been in the livery and stage business a number of years I think I know what will suit the public.—Yours, etc., W. S. Bishop.

### Operators Need Better Instruction

ANNVILLE, PA., Jan. 23.—Editor MOTOR AGE: If all manufacturers would see to it that persons who buy motor vehicles are given sufficient instructions, that they might understand them, three-quarters of the trouble now arising would be wiped out. My experience has been with two steam carriages of different makes. The first I used about two years, riding in it about 1,200 miles. For the first 300 miles all went well, but after that I had all sorts of troubles, caused by the pump not working on account of a little sand, crank braking, balls in the crank shaft breaking and above all because of the connection being too small. The burner would not work right, for various reasons, back firing occurred and, worst of all, the gasoline feed pipe broke off in the burner. I believe most of these troubles have been overcome by increased experience. My opinion is that the coming machine will be one of simplicity, light and yet possessing sufficient power. Too light or too heavy will not do.—Yours, etc., M. E. BRIGHTELL.

### Combination Pump was not a Success.

Columbus, S. C., Jan. 30.—Editor MOTOR AGE: I regret that my experience with the steam pump to furnish water and air has not been satisfactory and I do not intend using it on my new machine. I found that it took as much steam to run the pump as the vehicle itself, not only using too much gasoline but giving the burner so much heat as to considerably shorten its period of usefulness. I have had some trouble with tires which punctured too easily. I find the New York Long Distance tires give me no trouble and add little to the vibration.

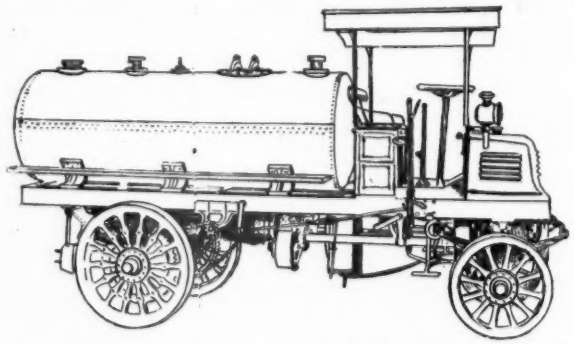
My last experience resulted in the loss of the machine. I left the fire burning at 6 o'clock. The pop valve let all the water out of the boiler and at 10 the whole thing burned up. I am now using the same make, however, a Locomobile.—Yours, etc., E. M. WHALEY, M. D.

### To Facilitate International Touring.

CHICAGO, Feb. 4.—Editor MOTOR AGE: It may interest your readers to know that the president of the Touring Club de France, representing nearly 100,000 members, officially wrote, on Jan. 7, to the French secretary of state asking him that foreign chauffeurs using automobiles in France and bearing cerificates issued according to their home government or city regulations, be no longer required to stand examination in Paris and obtain a new certificate there. The letter further expresses a hope that steps may be taken to have the same accommodations extended by foreign countries to French automobile owners.—Yours, etc., ALBERT RITT, delegate, 1511 Ashland block.

### The Kuhlstein-Vollmer Tank Wagon

In the line of automobile delivery apparatus, the wagon here illustrated presents something of a novelty. It was made for a German chemical manufacturer, apparently for the delivery of acids. Its total load is 12,850 pounds, inclusive of the tank, which weighs 2,600 pounds. The total weight is 24,000 pounds and its maximum speed 8½ miles; other available speeds being 2, 4 and 6 miles. At its lowest speed



the vehicle can climb a grade of 7 per cent with a full load. A 17-horsepower motor is used whose normal speed is 650 revolutions per minute. The arrangement of the parts is, briefly, as follows: A vertical two-cylinder motor and electrical device is in the front of the machine. Power is transmitted by means of a bevel and spur gear device, mounted on the crank shaft. The differential is carried on a countershaft, the drive to the wheels being accomplished by chains, one on either side. The fuel is kerosene, the consumption of which is 0.792 pound per horsepower hour at a cost of one-half cent per mile.

As has been previously noted in these columns, automobiles are made in a small way at Cherryville, Kan. Negotiations are going on to remove the plant to Topeka and increase its output.

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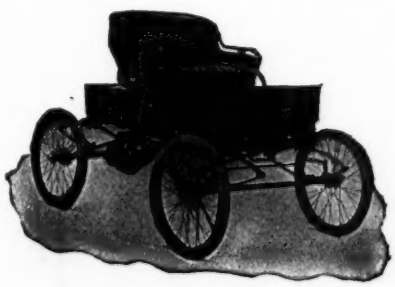

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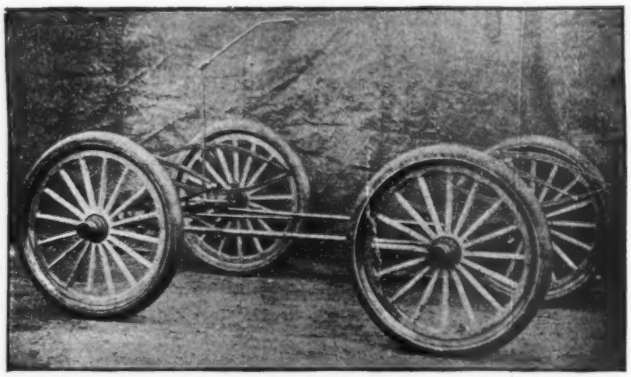

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## VETERAN CYCLISTS MAKE THINGS HUM

**Splendid Gathering Forms Metropole Cycling Club—Regular Runs and a Week's Tour—Quadri-Centennial on Col. Pope's Birthday—Plans for Publicity**

NEW YORK, Jan. 30.—The veteran and trade enthusiasts who have undertaken to do their best to revive the interest in cycling in the metropolitan district, with the further hope that a new wave of enthusiasm may reach other parts of the country, have showed that they really mean business. At an adjourned meeting held at the Park Avenue Hotel tonight they formed the Metropole Cycling Club, adopted constitution and by-laws and elected officers. The meeting was marked by genuine enthusiasm and good, common-sense suggestions as to the ways and means for bringing the revival about. It is a long time since there was such a gathering of veterans, who have been prominent in making bicycle history in the past. To them were added leading men in bicycle manufacturing concerns, prominent local dealers and supply men and a very general representation of cycling writers on the daily and trade press. No one was present as a mere spectator; they all enrolled themselves as members. To those present are to be added others interested in the movement, such as Theodore F. Merseles, Elliot Mason and Frank L. Martin. Letters have also been received from New England and as far west as Chicago approving of the movement and declaring in favor of similar crusades in other cities and sections of the country.

The constitution and by-laws were brief but to the point. The active membership embraces Greater New York and Hudson county, N. J., at $10 annual dues, and the associate roll the whole country at $5. Provision is also made for an honorary membership, wherewith to compliment various municipal officials and others helping along the movement.

The captain must call runs and promote a week's tour a-wheel in the old style. A new plan and project committee is appointed every 3 months and each committee must put through some one notable scheme for attracting public attention and arousing public interest. The other committee is the publicity committee, which is to see to it that cycling is not neglected by the newspapers.

Outside of what schemes the plan and project committee may originate and put through several suggestions of note were made, discussed and referred to committees for action.

A proposition to celebrate the quadricentennial of American cycling on Col. Albert A. Pope's birthday, May 20, met with much favor. A big night parade up Fifth avenue, with thousands of wheelmen in line to prove to the public that cycling is not dead, was suggested as a part of the day's programme. The idea struck those present as a good one.

The question of a cycle show had a long discussion. It was agreed that one was wanted, but that it must be made a novel affair so that it might not suffer by comparison in the minds of the public with the big Madison Square Garden exhibitions. Chairman Betts suggested that a motor cycle show would furnish a novelty. Of course leg propelled bicycles would have a place in it. It was argued in opposition to this that the club was formed to boom the bicycle and not to put it secondary to the motor cycle. It was suggested that an open-air show in some such place as Olympia Field on 135th street and Lenox avenue, with all sorts of cycle exhibitions and features added, such as the cycle whirl, fancy riding, daring feats and home trainer contests, would be a sensation. The idea was favorably received and the special cycle show committee, which is to sound the local trade and report next Thursday night, will give it due consideration. It was resolved positively, however, that the dealers should have a rebate on their space rentals to the full extent of the profits, as the club is in no sense a money making or desiring organization. It has been given a headquarters and meeting room free by M. L. Bridgman at No. 10 West 60th street and only needs enough money for stationery and committee expenses. All profits from its promotions are to be devoted to other schemes to boom cycling.

It was argued that it would be well for the club to undertake the future running of the Irvington-Milburn race, as the trade was both in and behind the club and ready to support its promotions liberally. A motor bicycle race was suggested as an added feature to the handicap.

Your correspondent reports the meeting and organization of this club thus fully that those in other cities may become interested in similar movements and be made acquainted with the lines along which the revival is being engineered in this city.

The officers elected were: R. G. Betts, president; Charles E. Walker, vice-president; M. L. Bridgman, treasurer; L. C. Boardman, secretary, W. H. Mackay, captain, and G. E. Stackhouse, W. C. Marion, C. A. Persons and F. C. Gilbert, executive committee.

Among the other well-known tradesmen and veterans already on the roll of the club, thirty having attended the meeting, are: Theodore F. Merseles, Elliot Mason, Frank L. Martin, G. E. Blakeslee, Charles E. Miller, G. E. Henry, E. H. Smith, A. G. Batchelder, Arthur N. Jervis, John C. Wetmore, Will R. Pitman, Frank Roche, Wallis Merrihew and E. L. Ferguson.

### American Cycles for Foreign Riders

WASHINGTON, D. C., Jan. 31.—The figures showing the exports of bicycles for the week just ended from the port of New York are as follows: Antwerp, material, $36; Bremen, bicycles and material, $200; British East Indies, $1,401; Berlin, $145; Brazil, bicycles and material, $60; British West Indies, $565; Central America, material, $107; Cuba, material, $393; velocipedes, $80; Glasgow, material, $70; Genoa, material, $296; Hamburg, material, $6,405; material, $2,998; Havre, $4,827; material, $2,884; London, $50; material, $4,365; $510; Liverpool, bicycles, $710; material $150; $29; Moscow, bicycles and parts, $5,305; San Domingo, material, $16; Southampton, material, $591.

## ASK THE GOVERNMENT TO INVESTIGATE

### Stockholders of Canadian Trust Accuse Directors of Paying Dividends Out of Capital to Hold Up Prices of Shares

THERE is a first-class rumpus brewing between the stockholders and directors of one of the Canadian "trusts," the former claiming that although only about $2,000 was earned last year, $175,000 had been paid in dividends. There was a meeting last week, at which the stockholders expressed themselves forcibly in the following resolution:

"That an advisory board be formed for the purpose of considering what action should be taken on behalf of the shareholders of this company against the directors, and to act as a consulting and advising committee from time to time in connection with solicitors and counsel, and generally to do all things necessary to be done for securing to the shareholders of this company the largest possible relief against the directors; and also communicate with all the shareholders with a view to secure their co-operation and assistance in the prosecution of whatever course they may undertake, and that the members of this board be Messrs. R. Thompson, G. W. Bedels, W. H. Mulkins, W. Lampert and — Gray, with power to add to their numbers."

"Resolved, That the shareholders of the Canada Cycle Motor Co. resident in the city of Toronto, in meeting assembled this 27th day of January, 1902, place ourselves on record as follows:

"(1) That we express our intense dissatisfaction with the last annual statement presented by the directors of this company to its shareholders, bristling as it does with admitted errors on the part and lack of business sagacity in the part of those whose reputation in the community led many to expect different results.

"(2) That we express our dissatisfaction and heartily disapprove of the policy of the directors in paying dividends of $175,000 when but $2,035.28 had been earned, and cannot accept the statement made that the directors were not in a position to know what business was being done (considering also the fact that the last dividend of $87,500 was paid in July, and the year's business of the company ended August 31), for it was their duty as directors to find out what money was in hand before declaring and paying the dividend.

"(3) That we express our disapproval of their policy of paying dividends because it induces many to purchase stocks as a dividend-paying investment, and it leads also to the conviction that the purpose of paying dividends such as the above mentioned is to induce purchasers of it and cause the stock to have an inflated value.

"(4) That we express our entire disapproval of the policy of the directors of this company in withholding from its shareholders a full and complete statement of the details as to expenditures and receipts of the said company.

"(5) That we believe it in the interests of the shareholders of this company and the public generally that the government of this province should appoint a commission to investigate into the affairs of this company from its inception and make public the result of such investigation.

"(6) That we bind ourselves to united action in endeavoring to make the directors of this company restore to its treasury the sum of $175,000 paid out in dividends last year, and to such further action as the advisory board appointed at this meeting shall see fit to undertake."

### Michael Wants to be a Jockey

New York, Feb. 3.—Jimmy Michael seems determined to give up pace following here for race horse riding abroad. He was around among the track owners today trying to sell his motor tandems. He is to sail for Europe on Feb. 18.

"I am going direct to Paris," said he, "where I can sign a year's contract with M. Charron's stable if I care to and make good as a jockey."

Both horsemen and cyclists expect him back here before the bicycle racing season is over. He has never been a success as a jockey and horsemen declare he should have made good with the horses long ago if he had it in him to be a rider. Cyclists think he will soon tire of trying to be a jockey if he does not meet with greater success than he did before, and that money inducements will bring him back to this country to follow pace long before the racing season is over.

### Good Sportsmen on Pacific Coast

SAN JOSE, CAL., Jan. 28.—Things have been quiet among the cyclists lately, but they are now arranging runs and race meets in preparation for the big annual events under the auspices of the California Associated Cyclists. They start the ball rolling Sunday with a 5-mile road race, to be followed on the 9th with a run to Alum Rock, and on the 16th by a hare and hounds chase. These events will be followed by others each Sunday. On March 2 and 9 races will be held and from that time on there will be contests for positions on the relay team to represent the Garden City Wheelmen in the annual 100-mile race around the bay. The club has won this race two successive years and if again successful will retain, permanently, the splendid trophy offered by the state association.

A number of riders will be attracted by the 6-day race, to be held at Atlanta, starting on February 17. After that there will be a paced race every week until May 30. Jacksonville will have a new track for Sunday racing, to be opened on March 1, while Birmingham will start night racing on April 1. A number of the racers are now at or on the way to Hot Springs, where a month of poker and baths is expected to put them in shape for the southern campaign.

Under the new Australian tariff, which is now in force, the import duty on motor vehicles is 20 per cent ad valorem, motor parts and accessories being dutiable at the same rate.

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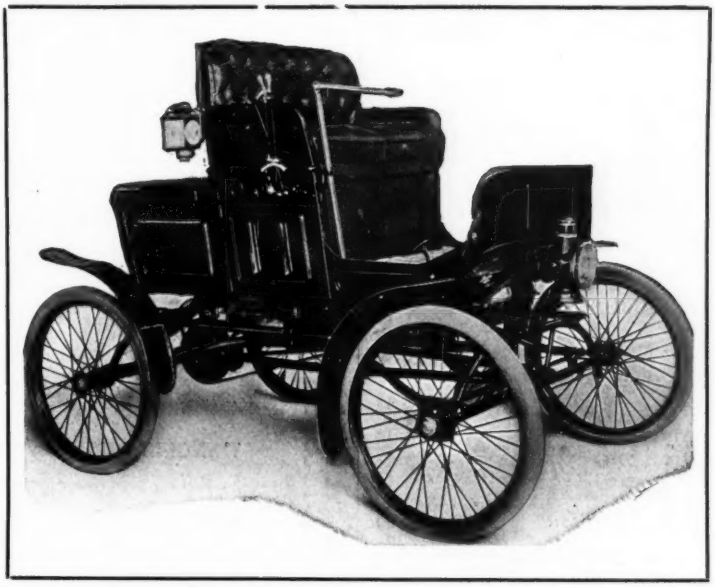

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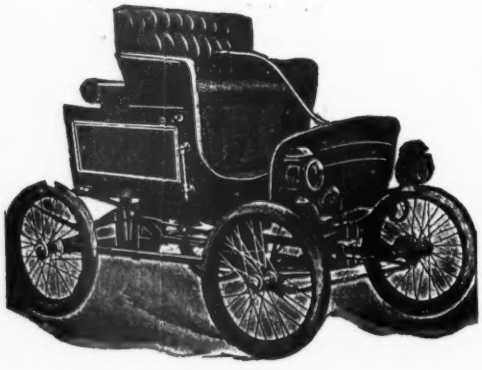

## ANNUAL MEETING OF THE N. C. A.

**Appeals of Racing Men are Considered and Sentences Lightened—Batchelder Again Chairman—New Men Elected to Office.**

New York, Feb. 3.—The cycle racing game is largely represented in town today by officials of the Board of Control, prominent track owners, seekers for franchises for new tracks, club delegates and professional riders; for tomorrow morning at the Astor House will occur the annual meeting of the National Cycling Association.

Of the Board of Control A. G. Batchelder, chairman; N. L. Turgun, of Buffalo; Charles Klosterman, of Baltimore, and R. F. Kelsey, of Boston, are on hand. The situation has been pretty well talked over by those having votes in the convention and there is small likelihood of there being any change in the composition of the Board of Control except in the substitution of Frank L. Kramer, the champion, for Tom Cooper, ex-champion, as the racing men's representative.

At a conference at the Astor House tonight of track owners the following were present: P. O. Sheehan, Providence; J. Frank Eline, Baltimore and Washington; John Irwin, Charles River Park; Archie Hughes, Syracuse, and L. H. Elmer, Hartford. It was pretty well decided that either individually or in combination an effort will be made to bring over leading foreign cracks to follow the circuit and engage in the motor paced contests.

The following new tracks, all on the coliseum order, will be built and take out active memberships: Lowell, by Lake, the baseball magnate; Saratoga, by "Pop" Elkes; Philadelphia, by Klosterman & Eline; Atlantic City, by Arthur Irwin; Pittsburg, by Barney Dreyfuss, and Jersey City, by Kennedy & Powers.

Tom Eck says he has the backing for a coliseum at Coney Island and a new track at Buffalo is probable. Fred Voigt has bought the New Haven coliseum from George Corbett and will also probably continue his management of the Vailsburg track. No announcement has been .ade yet as to what part the Madison Square Garden and Manhattan Beach tracks will take in the next season's racing.

New York, Feb. 4.—The annual meeting of the National Cycling Association was held in this city today. The Board of Appeals made the following rulings: In the case of Jay Eaton, who was suspended for life on a charge of crooked riding at Vailsburg, the sentence was cut down to two years. This will expire next fall. The appeal of Floyd McFarland from a decision of the Board of Control, which fined him $400, was dismissed.

Franchises were granted to Arthur A. Irwin for a track at Atlantic City; to the New Jersey Exhibition Company for a track between the Passaic and Hackensack rivers; to the New Haven, Providence and Philadelphia coliseums, and the Coney Island Velodrome Company.

A recommendation of the Bdard of Control that the punishment inflicted upon F. A. McFarland for his action in the six-day race at Boston be reconsidered and that he be fined $50 or suspended until May 15 next was accepted.

The following officers and boards were elected:

President, George M. Hendee, Springfield, Mass.; first vice president, C. B. Bloemecke, Newark, N. J., second vice president, Col. Felix R. Wendelschaefer, Providence, R. I.; secretary, Thomas A. Roe, New York; treasurer, A. G. Batcheller, New York. Board of Control—A. G. Batcheller, chairman; R. F. Kelsey, Boston; N. E. Turgeon, Buffalo, N. Y.; C. R. Klosterman, Baltimore, Md.; Harry Hartley, Jacksonville, Fla.; W. I. Doty, Denver, Colo.; W. L. Loos, Los Angeles, Cal.; Frank L. Kramer, Detroit, Mich. Board of Appeals—G. A. Needham, chairman, New York; Abbot Bassett, Boston, Mass.; M. L. Bridgeman, New York; Horace S. Vogel, Philadelphia; S. A. Miles, Chicago.

The suspension for life against Orlando Stevens, who was charged with crooked riding in Vailsburg, was changed to two years from the date of the sentence.

### Merit of the Hygienic Frame

Although the merits of the cushion frame have become so familiar to dealers who consider it worth while to do business to last, it is never too late to remind the trade of the desirability of stocking sufficient machines thus equipped. The wise dealer makes it his business, even though there may be no greater profit in the transaction —which, however, is rarely true—to impress upon his customer the desirability of purchasing a machine which will not only run but will give him satisfaction and insure his comfort and safety. To such dealers the Hygienic cushion frame has become a necessity. How greatly the demand for this device has grown is exemplified by the prominence given it in the catalogue of the American Cycle Mfg. Co., where it is shown fitted to all of the high grades of the company's manufacture. The makers who use the device have become convinced that it means comfort for the rider and increase of business and profit to the dealer.

### The Leacock Supply Co.

The R. J. Leacock Supply Co., organized early in January by a gentleman who was formerly prominent in the management of one of the departments of the Shapleigh Hardware Co. is now nicely located at 711 Pine street, St. Louis. As buyer and manager of the cycle and sporting goods department his acquaintance with the trade became extensive and valuable. Leacock's connection with sports dates back to 1887 and for a number of years he was one of the foremost athletes of St. Louis. The new company will do a jobbing and factory agency business. Every man connected with it has had long experience in the lines it will handle. It has already secured the representation of many good lines and seems likely to become a power in the trade.

An automobile factory is being erected at Trenton Junction, N. J. It will be 600 feet long and 100 feet wide.

## INFORMATION FOR PROSPECTIVE BUYERS

The accompanying illustration shows the 1902 model Kingston noiseless automatic carbureter, manufactured by the Kingston Mfg. Co. of Kokomo, Ind. It is the intention of the makers to show, by this section, the important part taken by the adjust- by this section, the important part taken by the adjusting screw, which instead of adjusting the flow of gasoline to carbureter, is used to adjust the vacuum tube and form a spraying nozzle, the level of gasoline being held below the needle point of adjusting screw. To illustrate: First connect the carbureter to inlet connection with standard pipe connection at p; then connect with gasoline at g, with standard pipe connection with not less than 4-inch head. Place a cut-off valve between

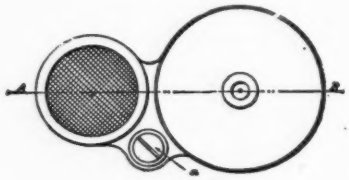

Fig. 1.

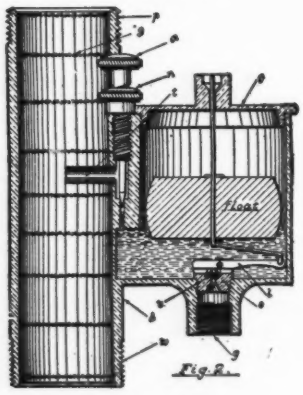


Fig. 2.

carbureter and supply tank, open cut-off valve and allow gasoline to fill cup until float shuts off the ball valve v. It will be noticed that the float is so connected that it exerts great leverage on the ball valve, and as the lever rests exactly on center of ball, and the ball is fitted in a perfect seat, the float is free to vibrate within the cup without disturbing ball, thereby insuring a perfectly constant level. This accomplished, the adjusting screw is opened part of a turn and the motor started, and the adjusting screw changed until a perfect mixture is obtained, when there will be no smoke or odor from exhaust. When adjusted, lock with nut n, and it will require no more adjustment except, perhaps, for a change of fuel.

The air pipe contains nine sections of brass wire gauze, as shown at 9, which excludes all possibility of fire from carbureter and aids in vaporizing the fuel. The lower end of the air pipe at u is threaded, and connection may be made to draw air from around the exhaust pipe. There are no mechanical working parts to this carbureter, consequently no noise and no wear. It is built substantially, the body and pipe all cast in one piece; no soldered joints, well finished and nickel plated. At present the carbureters are built in the following sizes: No. 0, bicycle size, with 15-16-inch, 20-pitch pipe connection; No. 1,.with 1-inch pipe connection; No. 2, with 1¼-inch pipe connection; No. 3, with 1½-inch pipe connection; No. 4, with 2-inch pipe connection, and larger sizes to order.

### New Gasmobiles will be Up-to-Date.

The present management of the Automobile Co. of America, whose Gasmobiles, for reasons heretofore unexplained, have not come through the factory with that rapidity and satisfaction to the directors which characterizes other places on which less time and one-quarter of the money has been spent, makes no secret that the gentlemen who formerly controlled the destinies of the concern were allowed to "resign" their positions without regret on the part of any one but themselves. Unfortunately the change has not been completed without friction. A claim has been made that there is due one of the persons formerly connected with the company the sum of $12,000. The sheriff was sent to the factory, but, it is said, unhesitatingly winked the other eye, said he knew the parties on both sides by reputation, and that of course the work would go right ahead as if nothing had happened. The latest report from Jersey is that the attachment was removed last Saturday.

Fortunately the stockholders of the company are men of such standing in the business world that the credit of the concern will not be affected by what is characterized by a gentleman who knows as much as anybody about the facts, as merely an attempt to injure the business of the concern.

The Gasmobile, unfortunately, will not be exhibited at Chicago. The new management is busy and devoting all of its attention to the production of new models of entirely new design, a task which will keep them hard at work if they are to produce machines to market this spring, as they say they will do. There is now going through the works a practically new four cylinder 4⅝x5¾ French tonneau body machine in twelve "exemplaries." Furthermore the company is getting ready its first Limousine body, now so popular in Paris, for the same type of gear used in connection with the tonneau machine. There are also six four-cylinder machines, 5x6 inches, just started. They are to have 34-inch wheels in front and 36-inch wheels in the rear. The new management is expectant that it will be able to turn out enough machines during the early part of the season to make a first-rate showing and to prove that the Gasmobile is now in the market to be handled on a business-like basis.

### Torbensen's New Running Gear

Torbensen Gear, Incorporated, with temporary offices at 141 Broadway, New York, which succeeds the V. V. Torbensen Co., of Newark, N. J., will soon put on the

Touring Car. 15 h. p. Price Complete, $2.000

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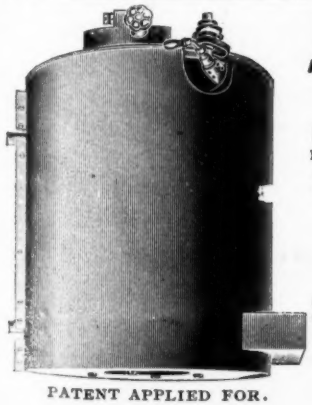

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**Absolutely Non-Explosi Can't Burn Out. Quick Steame r**

220 lbs. steam raised in 2¼ minutes from cold water.

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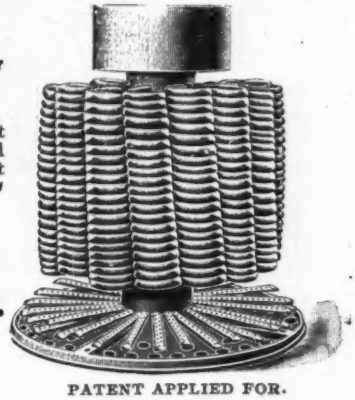

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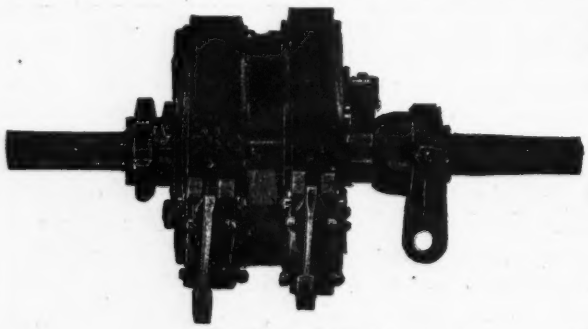

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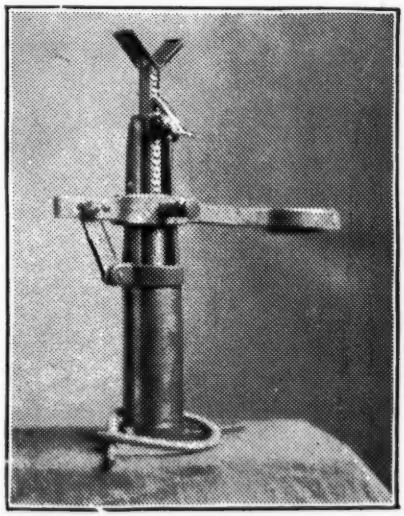
market a new gasoline vehicle running gear. This gear is specially designed for a gasoline motor, but may be used to advantage with an electric. It is built in such a manner that the transmission, variable speed and differential gears, brakes, steering and control form integral parts of the construction, thus obviating the necessity of special technical knowledge in mounting, as any suitable motor can be readily attached and connected up, and equipped with a body of whatever style desired. It has no chains. The rear wheels are driven directly from the hubs. The transmission is direct, with no idle gears in motion when running at high speed. All gearings and clutches are enclosed in oil tight casings, and no working parts are exposed to dust and dirt.

### Combined Lifting Jack and Pump

Here is a new combination. Schmidt & Mueller, of 703 Winnebago street, Milwaukee, have designed a com-



bination air pump and lifting jack, the parts being available for use either singly or together. In case of a puncture the vehicle can be lifted and, by the turning of a pin in the center of the lever, the pump may be released from the jack, the latter being held in place by the clutch at the top of the frame. The combined tool takes no more room and the makers say will be no heavier than an ordinary pump. The inventors do not expect to manufacture, but are looking for some one who will.

### A Parson Who is Also an Inventor

The Frantz Automobile Co., of Cherryvale, Pa., is making efforts to organize a stock company with $50,000 capital to manufacture a combined gasoline and kerosene generator and burner lately invented and perfected by Mr. Frantz, to whose other patents the company has the exclusive right. Mr. Frantz has also invented a tubular boiler which, he claims, will raise 200 pounds of steam in 2 minutes from cold water. To clean the boiler it is necessary only to remove the lowest coil and after it has been cleaned it can easily be replaced, as both ends connect by unions. After Mr. Frantz secures his patent he expects to turn it over to the present Frantz Automobile Co. Stock will soon be for sale for the increase of the capital of the company. Mr. Frantz is the preacher-inventor whose factory, etc., were described in MOTOR AGE some months ago.

### The Columbia Bicycle Oil

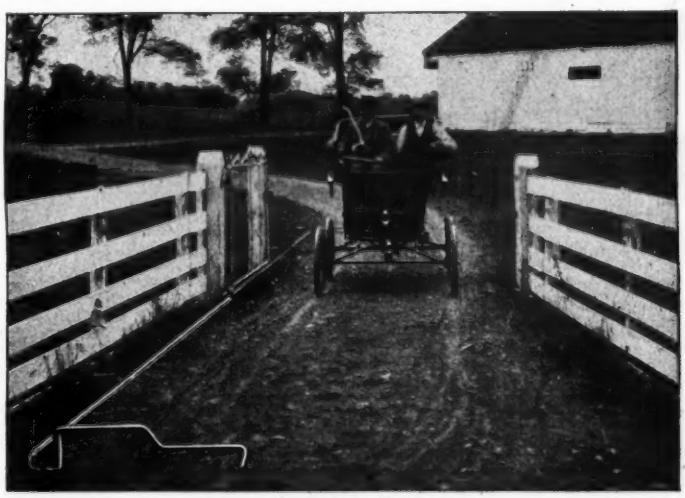
The Columbia bicycle oil put up by the Columbia Lubricants Co., 22 Burling slip, New York, is gaining in popularity in the trade and among the riders. At the company's office a particularly large demand for it has come from the Pacific coast. It is a high grade, light oil, suitable for cleaning, polishing and preserving metal work from rust. As a lubricant it cannot gum or harden.

### Air and Water Pumps.

The Union Steam Pump Co., Battle Creek, Mich., has brought out a combined air and water pump, also a single air pump and a single water pump for steam vehicles. They are thought of favorably by those who have used them. They are sturdy, well-made machines.

### Manlove Gate for Automobile Users.

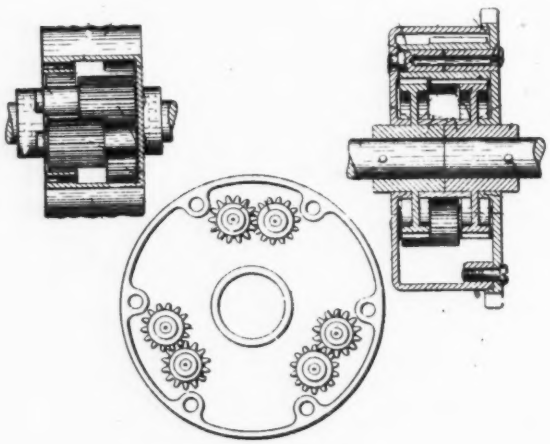
A device which has long been in use by people who appreciate the advantage of being able to drive into their premises without the trouble of dismounting to open a gate is made by the Manlove Gate Co., of Milton, Ind., and shown in the accompanying illustration. The gate seems to be even more applicable to the uses of an automobilist than a driver, inasmuch as the former, in its absence, must dismount twice, while the latter may lead his horse through, having to dismount only once. Unfortunately we are not all so situated that the Manlove gate will appeal to us, but to those who have need of a labor-saving device of the kind this one is recommended.



A Manlove Gate

## THE WEEK'S ISSUE FROM THE PATENT OFFICE

Among the recent issue of patents is one to Alexander Brown, of Syracuse, N. Y., which covers in detail the spur-gear type of differential manufactured by the Brown-Lipe Gear Co. This type of gear has become quite favorably known and is in use by several manufacturers of automobiles who are apparently of the opinion that it is common property, but the claims are specific and somewhat lengthy and are carefully composed



Brown-Lipe Gear

to cover any combination or set of combinations comprising two spur-gears with their axes parallel with each other and with the axis of the main shafts of the differential, said pinions being engaged with each other and respectively engaged with spur gears secured to the separate portions of the main shaft.

The essential components of this type of differential are two aligned shafts with spur-gears fitted to their adjacent ends, a cage or drum, journaled on the shaft or on projecting hubs of the two gears, and one or more pairs of spur-pinions which will be later described. The drum is the part to which the power is originally applied and also serves as a seat for the journals of the small gears. The gears on the main shaft are so located that a space, usually approximating the width of the face of the gears, is interposed between them. Each of the small pinions has a face with practically twice that of the gear with which it is in mesh and from one end a hub projects sufficiently to extend over and clear the face of the other gear.

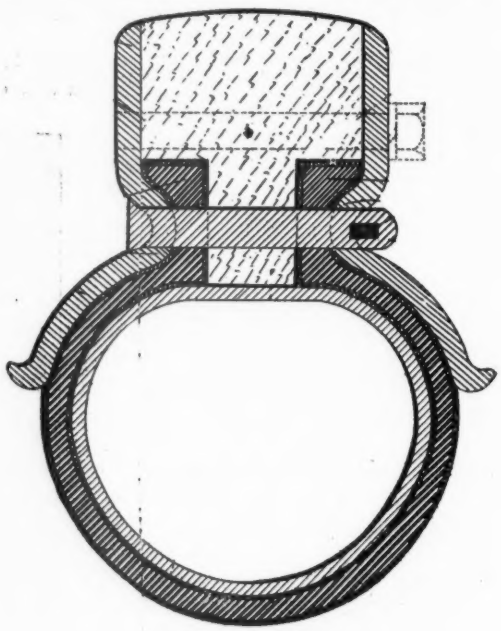
Both pinions constituting a pair are identical but are oppositely disposed so that their outer ends mesh with the gear on that side while at the inner ends they are in mesh with each other. Any number of pairs of these pinions may be used, all being of course identical. The method of operation is as follows. The power is applied to the drum, compelling it to rotate around the main shaft carrying with it the small pinions. If the load carried by the separate portions of the main shaft is evenly divided the pinions will not rotate but will carry the gears on the shaft around with the drum and at equal speed. If, however, the load applied to one portion of the shaft is greater than that carried by the other that side will be retarded or stopped entirely, under which condition the pinion meshing with that gear will be carried around it by the rotation of the drum and through its connection with the now idle gear will be given a rotary motion of its own, which motion it will transmit to its mate which will in turn transmit it to the opposite gear compelling it to revolve in the same direction as the drum but at twice the speed thereof.

Thus it will be seen that the speed of the two portions of the shaft will vary in inverse ratio to the load carried while the case or drum to which the power is originally applied will continue its rotation at unvaried speed.

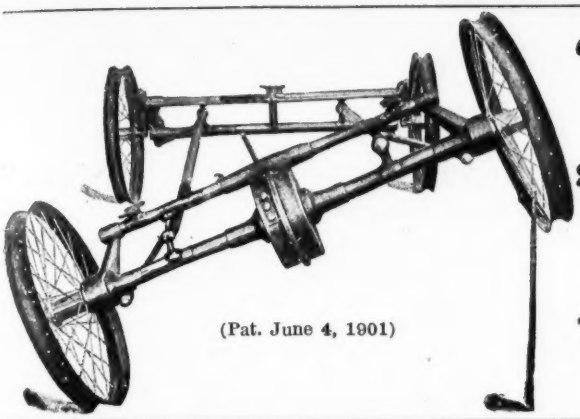
### Mechanically Fastened Pneumatic Tire.

Chas. Howells, of New York city, has been recently granted a patent covering a mechanically fastened pneumatic tire and a wheel particularly adapted for use therewith, but the construction of the wheel is not essential beyond the form of the rim and otherwise the wheel comprises no radical features. A felly or rim of wood is preferred, but it is not essential. The felly is formed with a deep recess on each side of its tread portion. Two circular flange-plates, the inner sides of which correspond with and fit against the sides of the felly, are securely attached thereto by bolts which pass through the flanges and the felly. The outer portions of the flanges flare outwardly to form a seat for the tire, the tread portion of which may be of any desired cross section.

The form of the tire is clearly shown in the illustration. It comprises an inner tube of the usual form and an outer casing strengthened with fabric and having thickened and reinforced edges which are seated in the



Howell's Tire



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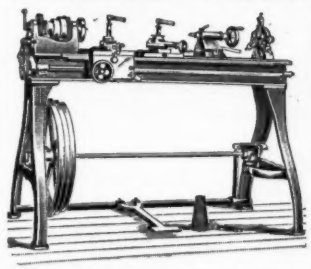

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REPAIR MEN,

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**Plain Gib or Swiveling Rest**

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# Reliable Steam Vehicles

**Twenty "Up-To-Date" Styles**

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Ours are very near perfection and we challenge comparison. :: Ask further particulars of :: :: :: :: :: :: ::

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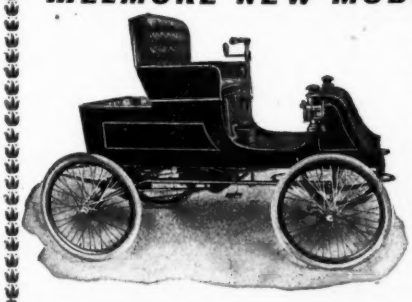
# ...ELMORE NEW MODEL 6...



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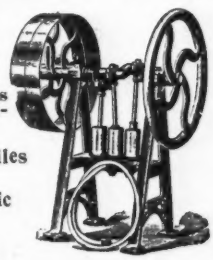
For Users and Makers of Automobiles and Pneumatic Tired Wagons



Manufactured by

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PORCELAIN.
¼ INCH SPARK
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TO GASOLINE
TO CONTROL SPEED
TO VALVE
SILK WOUND OAK FINISH ¼ INCH SPARK. PRICE $9.00.
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A. L. DYKE. ST. LOUIS.
METALIC CASE SEALED OUTLAST 4 OF ANY OTHER MAKE.
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recesses and against the tongue of the felly, where they are secured from the outside by central inwardly curved portions of the flanges which engage and securely hold them. These parts are connected by key bolts which pass through the flanges, the thickened edges of the tire and the tongue of the felly and are secured in position by keys which pass through the ends of the key-bolts and when in position to enter depressions formed in one of the flanges to receive them.

An advantage claimed for the keys instead of the usual screw threaded nuts is that the expansion of the elastic material of the tire will keep them seated in the depressions so that they cannot jar out and release their bolts or become loose, as is often the case with threaded nuts.

### Another Upton Gear Patent.

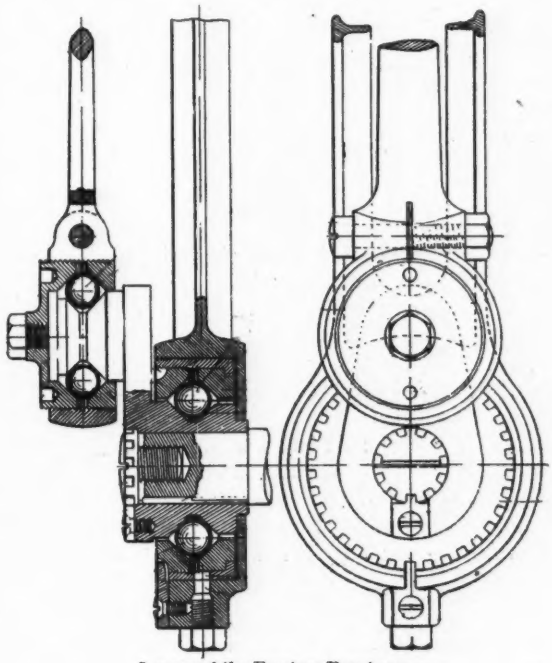
Colcord Upton, of Beverly, Mass., already well known as the inventor of several successful variable speed gears, has secured letters patent on another which has a range of four speeds forward and two reverse. As in all the Upton gears, the variations are obtained through the planetary system and the various combinations are thrown into operative connection by means of expansible ring clutches and peripheral band brakes. This pattern may be said to consist of two distinct sets of gears, one of which provides for two speeds forward and one reverse. The power is originally applied to the central shaft and by the first set of gears is transmitted to a sleeve surrounding the shaft. Secured to this sleeve is the second set of gears by virtue of which a variation of two speeds from the sleeve is obtained and the power is finally applied to the machinery to be driven.

The operating devices consist of two ring clutches and three band brakes, and it will be necessary to apply a combination of two of these devices to obtain any of the several speeds, as both sets of gears must be locked in the required combination in order to transmit the power to the final point of application.

### Locomobile Engine Bearings.

A feature of the common form of construction in steam engines for automobile use, to which considerable objection has been raised, is the method of adjusting the bearings on account of the tendency to throw the parts out of proper alignment. To overcome this George H. Reynolds, of Mansfield, Conn., has designed a new form of bearing the patent on which has been assigned to the Locomobile company. This bearing is of the four-point type and each set of bearings is adjusted independently without affecting the others. The frame of the engine is rigid and is provided, at its lower end, with two cylindrical recesses with an annular wall at the inner sides of the frame that partially closes the recesses at that side. As the bearings at one side of the engine are identical with those at the other side, but one bearing of each set will be described.

Within the recess in the frame is a ring-like receiver having at its inner edge an inturned flange and within this receiver are arranged the bearing cups as clearly shown in the illustration. The cup at the inner side of the frame fits tightly the inner bore of the receiver and rests against the flange thereof while the outer cup is threaded exteriorly and is screwed into the outer portion of the receiver which is at that point interiorly threaded for that purpose. The crank shaft is in three parts, the crank at each end being separate and keyed on to the shaft and is held against displacement by a screw tapped into the end of the shaft. The head of this screw is provided with peripheral notches that receive a locking finger secured to the crank or its hub in



Locomobile Engine Bearings

a suitable manner. The hub of the crank is provided with a circumferential groove, conical in cross section, that is, formed to present tapering side walls, between which and the adjacent walls of the bearing cups is the series of balls completing the bearing. The adjustable cup of the bearing is held in place against rotation by means similar to those employed in locking the screw in the end of the crank shaft.

It will be noticed that the receiver is loosely carried in the recess of the frame and is free to slide therein in an axial direction, thus permitting the outer members of the bearing to adjust themselves relative to the axiliarly-fixed inner members thereof so that perfectly free and adequate adjustment may be attained without danger of destroying the alignment of the bearing or throwing out of alignment or proper working position the crank or other rotating parts that may turn in the bearings. The removal of the screw in the end of the crank-shaft permits the entire crank and bearing, including the receiver, to be removed from the frame. The hub of the crank is provided at its inner end with a stop surface that co-operates with the inturned annu-

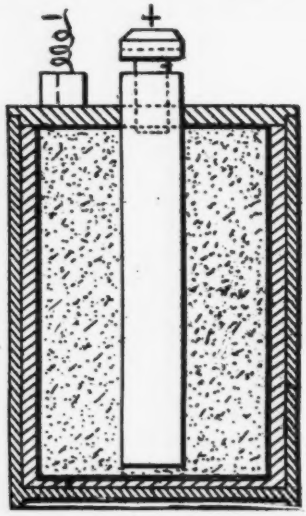
lar wall or flange of the frame to prevent the endwise movement of the crank-shaft.

The extreme lower end of the frame is provided with a threaded passage that communicates with a circumferential opening in the receiver and through which suitable grease or other lubricant may be inserted to furnish such lubrication as the bearings may require. This passage is normally closed with a plug screw. The crank-pin is provided with a circumferential groove which constitutes the inner portion of the bearing between the crank-pin and the connecting rod. The outer surfaces of this bearing are formed by conical cups screwed into the connecting rod which is recessed and interiorly threaded to receive them. The outer of these cups is closed at its outer side to conceal the end of the crank-pin and exclude dust therefrom and is also provided with an opening through which lubricant may be introduced. The end of the shaft portion of the connecting rod is split for a short distance from the recess containing the bearing and is provided with a compression bolt whereby the bearing cups may be locked against rotation or displacement.

The advantageous features claimed for this bearing are the positive and automatic alignment of the bearings and the ease with which the crank-shaft and all its accessories may be removed from the frame.

### A New De Dion-Bouton Battery.

Albert de Dion and Georges Bouton, comprising the well-known firm, De Dion, Bouton & Co., of Paris, are the joint inventors and patentees of a battery containing several new features. The positive electrode is a copper rod cylindrical in form located in the center of the cell. Surrounding the copper rod is a block of compressed




De Dion Battery

oxide of copper which is obtained by precipitation, the precise method being the treating a soluble salt of copper, such as the sulphate, by an alkali, such as soda or potash. The oxide of copper thus obtained becomes readily covered when subjected to a simple pressure, which is not the case with copper scales unless foreign substances, which impair the strength of the battery, are used. In the manufacture of this compressed material there is therefore no foreign substance used such as pitch, clay or other body which would tend to decrease the efficiency of the battery.

After inserting the copper electrode the compressed block is enclosed or wrapped in a thin piece of copper gauze, after which it is inserted in a cylindrical vessel of zinc, which constitutes the negative electrode and is provided with a terminal passing to the outside of the case. The wrapping of wire gauze is of a thickness to fit snugly in the zinc cylinder and is only intended to prevent the oxide block from becoming broken. The spaces in the copper gauze are completely filled with a solution of caustic potash which forms the electrolyte. After completion this battery may be hermetically sealed, as no gas is evolved from it. A feature upon which particular stress is laid is that the battery has the important advantage that it can be regenerated when run out by merely sending an electric current through it.

The action of the battery reduces the oxide of copper and forms potassium zincate and the passing of an electric current through this compound tends to decompose it, the oxygen combining with the copper and the potash being set free. The oxide of copper being formed again, the battery is once more ready for work.

### Mason's Brake Lock.

William E. Mason, of Boston, Mass., has designed a brake, the distinctive feature of which is a device for locking it, when applied, without requiring the continual application of pressure to the foot lever. With this end in view a portion of the mechanism is provided with a toothed rack adapted to receive a dog or pawl, the purpose of which is to hold the rack against return movement after the application of the brake. Provision is made whereby this pawl may be lifted out of engagement when it is desired to release the brake or it may be held out of engagement under normal conditions and only become operative when it is desired to leave the brake applied for a considerable period.

### Unique System of Speed Regulation.

Arthur C. Krebs, of Paris, France, is the inventor of a unique method of retarding the speed of a gasoline engine by throttling the vapor inlet. Located directly over the inlet valve is an electro magnet and the top of the valve stem is adapted to serve as an armature to the magnet under certain conditions. Secured to the fly wheel of the motor is a centrifugal governor, the action of which under excessive speed is to make an electrical connection with the magnet. When the connection is thus made the magnet exerts sufficient force on the inlet valve to prevent its opening and thus stops the admission of gas to the cylinder till the speed has fallen to a point where the governor returns to its normal position, which breaks the circuit and allows the valve to resume action. The American patents covering this device are assigned to Panhard & Levassor, of Paris, France.

THE MOTOR AGE

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